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ANTIOCH *the* REVIEW

SPRING '59

The Origin of Species--- 100 Years Later

Philosophical Implications of Darwinism
HARRY K. GIRVETZ

Darwinism and Christianity
ROBERT E. FITCH

Darwin and "Social Darwinism"
GEORGE E. SIMPSON

Ecology and Evolution
W. FRANK BLAIR

Genetics and the Destiny of Man
THEODOSIUS DOBZHANSKY

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Editor's Shop Talk

Our lead book review reminds us that *The Origin of Species* was a best seller upon publication. The public appetite had been whetted by the Darwin-Wallace papers at the Linnaean Society the year before and the publisher rushed the first printing through by November to catch the Christmas trade. It must also be remembered that the reading public which makes best sellers was a smaller and more closely knit one a century ago than it is now. But even with these factors in consideration, it reflects oddly upon our own day. What book of Freud's, what text in atomic physics, can boast a similar instant success?

Well, for one thing, Darwin was dynamite, blasting some basic preconceptions about human life, some highly cherished beliefs about human divinity, threatening, some thought, the moral basis of society. Books that shock sell better than books that soothe.

More important, however, is the makeup of the reading audience. A hundred years ago every literate man could become a scientist, and many did. The scientific societies heard papers by gentlemen astronomers, teacher botanists, and parson geologists (one of whom foisted the Piltdown Man upon us). Any educated and interested person could keep up with the whole field of science; it was not a discipline apart, let alone the honeycomb of ever-narrowing specialties it is now. Darwin's prose style is

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clearer and more graceful than most of the scientific writing produced today for any audience, but it was due to his work as much as anybody's that the great flowering of scientific activity (including the many social sciences) of the next hundred years resulted in the special studies, special languages, and the special problems of communication between science and the layman that beset us today.

We cannot, of course, go back to the days when science was the province of the interested amateur. We sometimes wish, however, that it was easier for the interested amateur today to keep up with science.

* * *

The response to our Winter issue, "The American Abroad," was most gratifying and is still coming in. News stories and editorial comment on it has appeared in several of the larger newspapers, the U.S. Information Service is reprinting two articles from the issue for use in its overseas installations, and we have heard pleasant comments from travellers, expatriates, and stay-at-homes.

We have also heard from some people who do not care for issues devoted to a single theme, who prefer the more varied diet of our normal numbers. Although we try for an interdisciplinary approach to our special themes, the basic topic remains the same; if you don't like Darwin in any form, for instance, you will not like the first half of this issue. We would appreciate hearing more opinions from readers about this. Do you like the "special issue"? How much of a special issue should be on the special topic—half? all? And if you like the idea, what topics would you like us to look into in the future?

* * *

An unusual feature of our Spring issue (which will *not* be a "special issue") is a "Conversation on Santayana." One evening last year a group of men, former students, friends, colleagues of George Santayana, sat down to share their memories of the man. Santayana was an elusive person to pin down—a Spanish Catholic at Harvard, a self-styled Puritan, a writer of delicate grace, a lone expatriate in Rome for the last half of his life. Perhaps this group reminiscence was the best way to arrive at a true portrait of him. At any rate, the conversation was recorded and edited for publication and we think it is a unique bit of biography, revealing facets of Santayana's personality and thought at startling variance with the rather chilly self-portrait he presented to the world in such books as *The Last Puritan*. The participants in the conversation were Horace Kallen of the New School for Social Research; John H. Randall, Jr., Corliss Lamont, James Gutmann, Herbert W. Schneider, and Ernest Nagel of Columbia; and Milton Munitz of N.Y.U.

* * *

And the Fall number of the *Review* will be another special issue, this one celebrating the centennial of John Dewey with a roundup of articles evaluating the long-term legacy of America's most prominent philosopher.

The Origin of Species---100 Years Later

An Introduction

By PAUL H. ROHMANN

> It is interesting to contemplate a tangled bank, clothed with many plants of many kinds, with birds singing on the bushes, with various insects flitting about, and with worms crawling through the damp earth, and to reflect that these elaborately constructed forms, so different from each other, and dependent upon each other in so complex a manner, have all been produced by laws acting around us. These laws, taken in the largest sense, being Growth with Reproduction; Inheritance which is almost implied by reproduction; Variability from the indirect and direct action of the conditions of life, and from use and disuse; a Ratio of Increase so high as to lead to a Struggle for Life, and as a consequence to Natural Selection, entailing Divergence of Characters and the Extinction of less-improved forms. Thus, from the war of nature, from famine and death, the most exalted object which we are capable of conceiving, namely, the production of the higher animals, directly follows. There is grandeur in this view of life, with its several powers, having been originally breathed by the Creator into a few forms or into one; and that, whilst this planet has gone cycling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, and are being evolved.

■ With these words, in 1859, Charles Darwin ended *The Origin of Species*—and started a revolution in man's thought. One hundred years later as we look about us at the state of that revolution, which we do in this issue of the *Antioch Review*, its most impressive feature is the completeness of its success. Not that all the implications of evolutionary thought have been fully explored in biology, philosophy, or any area of man's concern. The revolution is complete in that evolution has everywhere been accepted as a fact of life—as *the* fact of life. It is already thirty-four years since the Scopes Trial, and that was but a comic opera epilogue battle after the thunderous nineteenth century engagements of Wilberforce and Huxley and Butler. Today there is no serious challenge to the idea of man's

animal ancestry. A few fundamentalist cries are heard over the airwaves, but Billy Graham tactfully sidesteps discussions of Genesis as natural history.

Part of this complete acceptance must lie in the fact that the world was waiting for Darwin. As Loren Eiseley demonstrates in *Darwin's Century*, evolution was very much in the air during the first half of the nineteenth century. Lamarck, Cuvier, Lyell, and others had prepared the way for biological evolution; Darwin merely provided the mechanistic explanation of how it was accomplished. It is no discredit to genius to say that if a particular one had not appeared, the times would have called forth another. (In Darwin's case it is particularly apt: the times did call forth another—Alfred Russell Wallace.)

The success of Darwinism also lies in the way Darwin worked. The biographies make much of the observations during the voyage of the "Beagle" and of the publication of *The Origin* but say little of the intervening quarter century. There is little exciting to say about this period; it was filled with patient gathering and sifting of data, checking theory against fact, speculation against observation. Only the knowledge of Wallace's parallel conclusions forced Darwin into publication in 1859; he would rather have gone on amassing facts to buttress his great idea before unveiling it. This kind of detailed observation is so basic a part of the natural sciences today that we tend to overlook Darwin's pioneering work in removing life processes from the field of speculation and subjecting them to the same disciplines that had been applied to physics and chemistry. In so doing, he established for all time the study of at least the physical part of man as a science.

Credit for the success of Darwin must also be given the scientists who came after him. In all fields further investigation served but to clarify and strengthen his basic theory. Gregor Johann Mendel, the obscure Austrian monk, made the greatest contribution with his experiments with genes and heredity. But even the astrophysicists, who in Darwin's lifetime declared evolution impossible in the time they allotted to the age of the earth, basing their estimates on what they knew of the combustion of the sun, revised their opinions when knowledge of atomic fission and fusion allowed for far greater time spans in the solar system.

But the widespread acceptance of Darwinian evolution today among the non-scientists, the laymen, the men in the street and the men in the pulpits, must lie beyond this. It must lie in the fact that the descent of man is not as horrid an idea as at first imagined. On the contrary, there is something grand and wonderful in the concept of the oneness and interrelatedness of life—all life. The uniqueness of man is in no way mitigated by the fact that he owes his existence to a chemical accident in the remote geologic past. And human intelligence, human love, human aspirations can only be enhanced by knowledge of human life—by such knowledge as Charles Darwin gave us.

Putting together an issue of a magazine purporting to be an examination of Darwinism today can be a frustrating experience. We do not apologize for any of the articles in this issue, only for the ones that are missing. There is no field of thought that has not felt some impact of Darwin's theory during the past century and the editor's task is to narrow the selection down to what can be managed in a handful of articles. Early in the game, for instance, we decided to dispense with the straight biographical or historical piece on the premise that such material would be readily available elsewhere.

Darwin's greatest impact was on man's view of himself and his world and Harry K. Girvetz analyzes this revolution in thought in the first article. "Philosophical Implications of Darwinism" shows the depth and range of the questions that evolution threw into new perspective. These questions are greater and more pervasive than the shifts in religious beliefs and creeds, though the conflicts between religion and the new science made the greatest stir during the first century of Darwinism. Robert E. Fitch, in "Darwinism and Christianity," reports that peace has settled on that front and that both religion and science are taking new looks at each other and at themselves.

New knowledge is not always correctly interpreted nor put to the best use and the sad history of Social Darwinism is a credit neither to Darwin nor to social science. As reported by George E. Simpson, however, it provides an object lesson of particular relevance in these days of rapidly expanding knowledge.

The Origin of Species may be a hundred years old, but the last fifty years, from Einstein to Sputnik, belonged to the physicists. Vannevar Bush predicts that the next half century will see equally spectacular progress in biology. W. Frank Blair, in "Ecology and Evolution," reports on one of the newest branches of biology, a direct descendant of Darwin and a field of growing concern to man as his domination of nature becomes more nearly total.

Finally, Darwin's ideas have given us new tools with which to understand our animal heritage and probe its future, and possibly they provide us with the insights we will need in order to control what future we may have. In "Genetics and the Destiny of Man," Theodosius Dobzhansky demonstrates the close race we are running between knowledge to understand the future and knowledge to shape it to our best use.

There is much else we wish we could have included. Dr. Dobzhansky's view of our genetic future, for instance, raises many questions which should affect politics and international relations. Ecology and conservation as political and economic problems are among the topics omitted. And every branch of anthropology, sociology, psychology, medicine—to name only a few obvious fields—could make their contributions to a discussion of evolution. But this issue of the *Review* is only one gathering of Darwin topics in this centennial year. Much has already been written elsewhere; the lead feature in our Book Section reviews the published material already in hand. Much more is still to come: of greatest scholarly interest will be the Darwin Centennial Celebration at the University of Chicago in November. The Darwin student will find no dearth of material this year. The articles which follow may only whet his appetite, but we hope he will find them nourishing as well.

Philosophical Implications of Darwinism

By HARRY K. GIRVETZ

■ How did the scientific developments with which the name of Darwin is identified permanently influence man's view of himself and the world he inhabits? This is the formidably broad question to which a discussion of the philosophical implications of Darwin's work must address itself. Happily, the very breadth of the question exempts one from the even more formidable refinements and technicalities which are the bane of so much philosophical discussion.

Curiously, philosophical literature is lacking in a summary of the philosophical implications of Darwinism. Long ago John Dewey wrote an article called "The Influence of Darwin on Philosophy," but he touched on only several items not including his own instrumentalism. Such a summary may ignore the more ephemeral inferences derived from Darwin's work—ephemeral because they have failed to survive long critical examination and were never in fact supported by anything that Darwin said. For a different reason one may ignore the impact of Darwin's work on theology. This has been abundantly recorded. Moreover, as Dewey pointed out in the article referred to, the theological controversies provoked by Darwin's work have only served to obscure its deeper and more abiding implications.

To begin with, Darwin compelled those who came after him to take time seriously. We need to remind ourselves that the pre-Newtonian world was, by comparison with the world as we view it today, a miniature universe, narrowly circumscribed in space and time. Its

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spatial boundaries were erased by the great revolution in the physical sciences which began with Copernicus and reached its culmination in Newton. But the temporal boundaries remained intact. Newtonians continued to think of the universe as having been created only a relatively short time ago. In abandoning creationism, with its implication that living species have come into being at a given instant in time, and embracing the notion that species have a common origin, Darwin had to postulate vast spans of time during which such an evolution might have occurred. To be sure, such an assumption might have seemed utterly untenable had not LaPlace, Hutton, Lyell, and others paved the way. But it was Darwin's work that drove the point home and forced upon us the vast temporal perspective that we now take for granted.

Among the changes of emphasis and interest associated with the scientific revolution of the seventeenth century none was more significant than the insistence of natural philosophers on viewing nature in its aspect of becoming rather than of being. "I can only listen with the greatest repugnance," declared Galileo, "when the quality of unchangeability is held up as something pre-eminent and complete in contrast to variability. I hold the earth foremost distinguished exactly on account of the transformations which take place upon it." But the shift of attention from fixed forms to the observation of occurrence and change was limited to the study of physical nature. The unchanging forms which Galileo and those who worked in the Galilean tradition had expelled from the physical world remained intact in the world of biology, to which indeed they seemed especially apt. By freeing biology from its commitment to the immutability of species, that is to say, from its preoccupation with fixed forms, Darwin made it possible for the biological sciences to move beyond the activities of classifying and defining and become truly experimental. But this development and its attendant consequences, while enormously important for science, is not so significant here as was the more general consequence that it meant an expansion of the category of change to embrace all of reality—the biological and, ultimately, the institutional or social, as well as the physical.

Ever since men have thought seriously about the world—and possibly before—they have alternated between stressing those aspects of reality that are fixed and permanent and those features that are

changing. More than they have known they have been influenced by their mood and by the kind of world in which they have lived. Those who have stressed the stability of nature and have been drawn to that which abides are possibly the less venturesome and the more insecure. Those who prefer to brave the flux belong to the ranks of what William James called the "tough-minded." The lines were first clearly drawn by Parmenides and Heraclitus: Parmenides who found that change is an illusion and that true being is static; Heraclitus who found the world like an eternal fire "with measures kindling and measures going out." On the whole the Greeks followed Parmenides, as did the Middle Ages. But in modern times it is the spirit of Heraclitus that has prevailed and Darwin did a great deal to tip the scales in his favor.

However, it is not enough to say that the impetus Darwin gave to evolutionary theory served to make the category of change ubiquitous. Evolutionary theory requires us to reckon with a peculiar kind of change, that kind of change, namely, that manifests itself as *novelty*. Darwin's mutations (as they came later to be called) and the myriad species to which they may give rise represent the appearance of something wholly new.

This notion is largely alien to the pre-Darwinian mentality and most especially to the mechanistic point of view born of seventeenth century science according to which change is viewed exclusively in terms of the movement of an invariant unit in space (or space-time). Such change can be formulated in terms of mathematical equations and hence can be predicted with mathematical certainty. The possibility of novelty is rejected; contingency has no place in the vocabulary of strict mechanism. Indeed, in the Newtonian scheme, God—once he has created the universe—is assigned the heavy responsibility of guarding against contingency. Hence everything in nature proceeds with complete regularity according to inexorable law which, once discovered, permits one to read the future with all the certitude of a mathematical calculation. This was the ideal of knowledge that dominated the thinking of the seventeenth and eighteenth centuries.

Since Darwin's time we have come to see that among the rhythms and repetitions of nature there is an element of contingency; the constancies upon which seventeenth century science built the reign of universal and necessary law are still there but they are

infected with the irregular and unpredictable; uniformity in nature is now qualified by difference, unity by diversity, the certain by the precarious; we are always to some degree at the mercy of the adventitious and fortuitous. We live, as John Dewey has said, "in a world which is an impressive and irresistible mixture of sufficiencies, tight completeness, order, recurrences which make possible prediction and control, and singularities, ambiguities, uncertain possibilities, processes going on to consequences as yet indeterminate."

Thus, what had seemed in the older view to be finished and complete—as a great machine might be regarded as finished and complete—must be recognized as always in the making. Nature is not a closed system; the future is open. One cannot deal with nature in terms of finalities; nature is forever unfinished, replete with novelty, and to this extent quite indeterminate.

Now it is of the essence of novelty that it cannot be mathematically demonstrated, which is to say, it cannot be *deduced* from the antecedent events of which it is an effect and is in this sense contingent. From this must follow an enormously significant consequence: the old rational ideal of knowledge as a body of mathematically demonstrable truths is in the nature of the case illusory. Complete knowledge is unattainable; the evidence can never *all* be in. If, with Professor Broad, we are able to say, "Whatever is has become and the sum total of the existent is continually augmented by becoming," if, more plainly, we are able to reverse the old adage and say that there's a great deal that *is* new under the sun—including the sun itself—this is because the evolutionary mode of thought forced the insight upon us. And if, because of this, the ancient ideal of a body of fixed and final truths must be abandoned, this too is a consequence of the teachings of Darwin, however indirect and unintended.

Thus far what has been said of Darwinism might have been said of evolutionary theory in general, although Darwin's work gave evolutionary theory so great an impetus that it would be difficult to avoid associating its general implications with his name. Nevertheless, Darwin did not invent the idea of evolution. Strictly speaking, Darwinism refers to a particular explanation of evolution, that explanation, namely, that goes by the name of natural selection. The

scientific status of the principle of natural selection has been discussed elsewhere in this issue. Its philosophical implications were enormous. The idea of a common origin of species, despite its incompatability with a literal interpretation of the biblical account of creation, would have been much more readily accepted had Darwin ignored the principle of natural selection and postulated a guiding agency or purpose directing the evolutionary process. Such a teleological explanation of evolutionary change, while it might have enhanced Darwin's popularity, would have deprived his explanation of scientific standing, of course, for science takes seriously the dictum of Spinoza that "nature has no fixed end in view, and that all final causes are merely fabrications of men."

On the level of common sense it is indeed tempting to pass from the adaptive nature of many of the characteristics of an organism to the conclusion that such adaptations are evidence of the operations of a purposeful agency. The lizard appears to be provided with a coloration that blends it with its background *in order to* protect it from predators; the giraffe with a long neck *in order that* it may reach the higher foliage; man with intelligence to compensate for an unarmored, nearly unarmed, and relatively slow moving body. We are prone to be as addicted to finalism as the elderly lady who, upon seeing a tiny kangaroo peer out of the pocket of a mother kangaroo, said: "Good heavens, what will they think of next?"

Long before Darwin, Newton had asked: "How come the bodies of animals to be contrived with so much art and for what ends were their several parts? Was the eye contrived without skill in optics, or the ear without knowledge of sounds?" Even the greatest of scientists, it may be noted, are not always scientists; they are also lovers, gourmets, art devotees—and humble believers. Newton answered the questions cited above by invoking divine agency.

Darwin, writing almost two centuries after Newton, did not "explain" these marvels by appealing to the idea of purposeful intervention. In the Darwinian scheme heritable variations occur at *random*; they are blind and purposeless and do not happen in order to further the survival of the organism. The great majority of variations are in fact harmful to the organism, thereby reducing the chances of survival. Darwin described them as "accidental as far as purpose is concerned."

It is upon such variations that *natural* selection works. Natural selection provides an explanation of evolutionary change without postulating a teleological principle; there is no need for a "vital force" or "inherent tendency" or "entelechy" or any other of the inscrutable agencies which substitute mere words for genuine explanation. The orienting factor—by which one means not a supernatural force or agency, or pre-determined goal that guides change but a factor that permits us to discern a direction in change—is adaptation: organisms have changed in the direction of becoming more and more adapted to their enviroment.

Darwin is by no means completely free of teleological influence and he himself confessed, when commenting on his difficulties in dealing with traits lacking in survival value, that "I was not . . . able to annul the influence of my former belief, then almost universal, that each species has been purposely created. . . ." But in principle Darwin's explanation of the origin of species dispenses with appeals to laws of purposeful development of the kind so dear to the romanticist philosophers who preceded him, as it dispenses with creative acts, and relies entirely upon the operation of natural forces. When he wrote in the *Origin* that "species are produced and exterminated by slowly acting and still acting causes," Hutton's principle of uniformitarianism was at last extended to the world of living organisms.

The naturalistic framework in terms of which Descartes had sought to understand the organic world thus finds impressive scientific vindication. It must be remembered, of course, that the work of Vesalius (1515-64) in anatomy, and of Harvey (1578-1657) and Malpighi and Borelli in physiology had already initiated a naturalistic approach to the study of organisms. Until Harvey discovered the mechanical principles governing circulation of the blood and Borelli (circa 1670) the mechanism of muscular motion, the functioning of organisms had been explained since the time of Galen and the Greeks almost entirely by reference to an assortment of "animal spirits" which were thought to inhabit living bodies. The great chemist, Lavoisier, and his followers, in applying the theory of combustion to the processes of respiration, nutrition, and the generation of animal heat carried this great work forward. Darwin, by extending naturalistic principles to an understanding of individual

variation and the origin of species, brings this work to a culmination.

To be sure, Darwin's work throws no direct light on the origin of life itself, a problem concerning which Darwin faced the limitations of his science and permitted himself only the briefest speculation.[1] Even so, men were bound to seek here for the same natural causes which Darwin had found for them in explaining the origin of species. Moreover, the evolutionary approach had accustomed them to finding continuities and relationships in the organic world where discontinuities had heretofore been taken for granted. The same habit of thought that finds living species related and erases the sharp line of demarcation which had traditionally divided them will, in good time, seek for continuity and relatedness between the living and non-living.

There is a second and at least equally important sense in which the Darwinian version of evolution helped to establish the naturalistic point of view that now dominates Anglo-American philosophy. In the Darwinian view man himself is a product of evolution. To be sure, the problem of man's relationship to other organisms receives hardly any attention in the *Origin*. There is only a deliberately perfunctory observation in the concluding passage in which Darwin promises that "Much light will be thrown on the origin of man and his history." It was not until 1871, twelve years after the appearance of his *magnum opus*, that Darwin's *Descent of Man* was published. In any case, it is difficult to exaggerate the consequences of Darwin's contention that man, too, is related by descent to simpler organisms and is a product of natural selection.

---

[1] "It is mere rubbish, thinking at present of the origin of life; one might think as well of the origin of matter." Referring to his earlier language in which he speaks of life "having been originally breathed by the Creator into a few forms or into one," he adds: "I have long regretted that I truckled to public opinion, and used the Pentateuchal term of creation, by which I really meant 'appeared' by some wholly unknown process." Elsewhere he allows himself to reflect: ". . . if (and oh! what a big if!) we could conceive in some warm little pond, with all sorts of ammonia and phosphoric salts, light, heat, electricity, etc., present, that a proteine compound was chemically formed ready to undergo still more complex changes, at the present day such matter would be instantly devoured or absorbed, which would not have been the case before living creatures were formed." (*Life and Letters*, Vol. III, p. 18)

Prior to Darwin, man's absolute separateness and uniqueness was generally taken for granted. The Cartesian view that dominated the seventeenth and eighteenth centuries had boldly expanded nature to include celestial as well as terrestrial objects, the organic as well as the inorganic, even man's body as well as other living bodies. But it significantly excluded that which is most distinctive of man, namely his mind (or soul). Between man and nature a great chasm yawned. Instead of bridging the chasm the Cartesians deepened it. This radical dualism between a realm of mind (however constricted, in the Cartesian view) and a realm of matter created vast and ultimately insurmountable difficulties for philosophy. It was this dualism which Darwin's views concerning the origin of man helped greatly to break down.

Darwin refused to soften the impact by introducing a teleological factor in explaining man's origin. "We have seen," he declares, "that man is variable in body and mind; and that the variations are induced, either directly or indirectly, *by the same general laws* as with the lower animals" (my italics). Even A. R. Wallace, Darwin's brilliant rival whose essay on evolution anticipated all the basic arguments of the *Origin*, including the theory of natural selection, recoiled from explaining the origin of man in terms of natural selection. Warmly as Wallace embraced the inclusion of man under the notion of common origin, something more than natural selection is needed to explain how man is produced, he contended.

Not so Darwin: "I am aware," he declares, "that the conclusions arrived at in this work will be denounced by some as highly irreligious; but he who denounces them is bound to show why it is more irreligious to explain the origin of man as a distinct species by descent from some lower form, through the laws of variation and natural selection, than to explain the birth of the individual through the laws of ordinary reproduction."

The assertion that man derives from simpler organisms and hence is continuous with the rest of nature leads easily to the conclusion that the system of nature is all inclusive. To say this is not, however, to reduce everything to the same dead level. Man is not, therefore, to be understood in exclusively physical terms. That same novelty to which Darwin's work calls our attention enables

us to understand that the nature of which man is a part is infinitely rich, expressing itself in many ways of which the physical is only one. Thus, thanks to insights suggested at least in part by Darwin's work, it is possible to place man within the system of nature without ignoring the distinctive qualities that differentiate him from the *merely* physical or *merely* biological.

Darwin's work thus helped to break down the dualism which dominated so much of the philosophical thinking of the 17th century and after. Indeed, it may be said that just as the labors of Galileo and Newton in the science of mechanics tended to encourage dualism, so the labors of Darwin in biology mitigated against dualism. Not, indeed, in favor of a materialistic or idealistic monism—these, too, are in eclipse. Rather, the result has been a rich pluralism in which the variety of nature is recognized at the same time that all of its parts are regarded as causally related.

A final consequence of Darwin's work needs to be noted. The extension of Darwinian principles to explain the origin of man has suggested, primarily among those who call themselves pragmatists or instrumentalists, a re-examination of the nature of knowledge, and has resulted in a major effort at recasting the traditional conceptions of knowing and the nature of truth.

Traditional rationalism or apriorism has long been under fire. To treat knowing as the activity, above and beyond experience, of a "rational faculty" to which the principles from which all knowledge is derived are somehow manifest, to speak with Descartes of a "natural light of reason," is to invoke an occult agency, if not to play with words. This is increasingly agreed.

On the other hand, traditional empiricism has been charged with equally fatal shortcomings. For the most part empiricists have viewed knowing as an affair in which an experiencing subject somehow "lays hold of," grasps, apprehends ulterior objects. When an object is truly known there is said to be a *correspondence* between it and our ideas of it. The knower is regarded as apart from the objects known—he is indeed "detached"—and sensations are in some marvellous way disclosures of such objects and hence are "cognitive." Moreover, this cognitive feat is treated as though it occurred gratuitously: the fact that it serves the purposes of the organism is a

happy one, but presumably quite incidental to the knowing process itself.

But, argues the instrumentalist, once the knower and the object known are polarized and set over against each other as subject and object—where the subject is somehow the focus of an "inner" reflection of an "external" referend, and once the cognitive relationship is treated as "different" in such a way as to render it unrelated to any other process in nature, is not knowing rendered utterly mysterious?

By what feat of transcendence is the mind able to get outside itself to reflect the real world? Does the mind glow like a magic ray as it brings "illumination"? If so, it is an evanescence for which there is no analogue in nature. The very words "reflect," "grasp," "see," "apprehend" which we use to express the cognitive relationship are surely not meant to be taken literally. Does the mind really reflect like a mirror, or grasp like a hand, or see like an eye? If, in fact, all these terms are found to be used in a metaphorical sense, in what sense *is* the "given" in experience given to us?

Even worse, how on the conventional view can we ever know that we know: how can we get outside the circle of our ideas to test their congruence with what is external to them?

All these are artificial and ultimately insoluble problems which disappear, according to the instrumentalist, once we approach knowing as the activity of an organism engaged in coping with its environment. "Suppose we take seriously the contribution made to our idea of experience by biology," argued John Dewey. Knowledge, he asserted, "is not something separate and self-sufficient, but involved in the process by which life is sustained and evolved."

Once knowing is related to the life process and is regarded as the most versatile of the innumerable devices variously available to living organisms in their struggle to survive and maintain themselves, it is no longer a mysterious and arbitrary evanescence that defies explanation. In his *Logic* Dewey writes: "If one denies the supernatural then one has the intellectual responsibility of indicating how the logical may be connected with the biological in a process of continuous development." By the biological is meant those processes that involve the dynamic interaction of the organism and its environment.

So viewed, thinking is a mode of "directed overt action" and "ideas" are "anticipatory plans" designed to resolve a difficulty or solve a problem. And, since they are essentially tools or instruments—hence instrumentalism—their value is determined by reference to whether or not they work.

The foregoing is an oversimplified account of a position that involves many complications and has evoked much criticism. The main interest here has been to show how, in the climate of opinion produced by the Darwinian treatment of man as part of the biological order, a new conception of the nature of mind, of knowledge, and of truth has become possible.

A hundred years have elapsed since the publication of *The Origin of Species*. By this time we have had ample opportunity to explore its implications and to understand that they require a new philosophy of man and of the universe. Such an understanding has not come easily, but today most philosophers would agree that to revert to pre-Darwinian thinking is, as William James said, to be guilty of an absolute anachronism.

A historian recently remarked that there are events in the life of nations such as the American Civil War and the French Revolution cutting their history in two so that nothing is ever the same again. Such events are as close as history comes to presenting us with a clean break between the past and the present: the past is irretrievably gone in a way that would not have seemed possible a short interval before and everything associated with it is suddenly antiquated; the present with everything in it that earlier had seemed extravagant and forbidding is clamorously upon us, exacting recognition even from the most reticent. If this is true of the history of nations it is also true of intellectual history, and in the history of ideas the appearance of *The Origin of Species* was such an event. Thereafter, as the foregoing comments are intended to indicate, nothing was the same.

Darwinism and Christianity

By ROBERT E. FITCH

■ There were eight days in July of 1925, as Clarence Darrow and William Jennings Bryan confronted one another in a court in Dayton, Tennessee, when the issues between Darwinism and Christianity appeared to be clean-cut. At that time one could take his stand on one side or the other of a Zoroastrian conflict between light and darkness, truth and error. The immediate issue was whether or not the Tennessee law forbidding the teaching of evolution in the public schools could be enforced against a biology teacher by the name of John Thomas Scopes. The larger issue, as we civilized folk saw it, was whether or not the superstitions of religion might put a limit to the free inquiries of science; or, as the Judge saw it, whether or not Dayton was another Nazareth, still daring with a provincial valor to champion against all the hosts of Satan the eternal Word of God.

We civilized folk knew how to laugh at Bryan and to laugh with Darrow. It was comical to watch Bryan repeat again that old saw about the Rock of Ages' being more important than the age of rocks. We did not at the moment recollect Nietzche's teaching: "O my brethren, is not everything at present in flux? Have not all railings and gangways fallen into the water? Who would still hold on to 'good' and 'evil'?" As for Clarence Darrow, we did recollect a public discourse of his when, fresh from his triumph in the Leopold-Loeb case, he argued that one reason we have so many criminals is that we have too many laws. As when a drunkard is always bumping into lamp-posts, part of the fault lies in too many lamp-posts. So you see, it is society that is to blame, more than the individual.

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None of us perceived the ironies and paradoxes in the great debate. On the face of it Darrow was the champion of freedom of conscience and of the freedom of science. Yet he held to a rigorous biological and environmental determinism which must annul the meaning of freedom, make a mockery of truth, and annihilate the dignity of man. Bryan, as the spokesman for popular sovereignty, appeared as the enemy of science and of academic liberty. Yet according to his lights he did consciously cherish a loyalty to the freedom, responsibility, and dignity of man. We could remark, however, the strikingly simian countenances of the two protagonists in the drama, and savor the unconscious humor when on the seventh day of the trial Officer Rice, calling the court back to order, cried out, "People, this is no circus. There are no monkeys up here."

As for myself, being a civilized young man, I watched this affair with interest but with a deeper emotion than some others knew. For during the preceding winter of this year of 1925, as a theological student and a very minor assistant at the First Presbyterian Church in New York City, I had heard Harry Emerson Fosdick preach his last great sermons before being put out of his pulpit, at the mandate of the Presbyterian General Assembly, essentially for a failure to accept the fundamentalist dogma. At issue, presumably, were the seven questions, as Bryan enumerated them: the Inspiration of the Bible, the Deity of Christ, the Virgin Birth, the Blood Atonement, the Bodily Resurrection of Jesus, the Miracles of Our Lord, the Origin of Man. And in this church, as in the court at Dayton, it seemed for the moment as though obscurantism were triumphant.

So I cut my ties with this Christian faith. I abstained from ordination. I even canceled my membership in the church of Christ. I found myself a new church, the Socialist Party, and a new religion, the philosophy of John Dewey. These new securities that I embraced might be good for another ten or fifteen years. But, as I must at last come to see, they were not any Rock of Ages.

II.

It is now thirty-four years since the climax of the battle between Darwinism and Christianity in the United States. In this year of Our Lord 1959 we are celebrating the centennial of the publication of

The Origin of Species. The most striking thing at this point is that the issues which were once so clean-cut are presently confused. As we look back from a new perspective, there are fresh revelations of fact and of meaning.

One striking change is in the economics of the two professions of science and of the Christian ministry. In Darwin's time the assured income went to the clergyman, not to the scientist. Darwin himself was fully trained for the ministry, and missed ordination by what still looks like a sort of accident. Thomas Huxley never had a mind to be a preacher—except from his own secular pulpit—and was gravely concerned for a while as to whether or not he could make a decent living in the profession of science. The broader feature of the situation was that the natural sciences were looked upon as pretty much of a luxury, whereas the humanities had a social utility in preparing persons for the three important callings of the government, the church, and the armed forces. In brief, the humanities fitted one to be a gentleman; but one had to be a gentleman already in order to be able to afford the sciences. It was money from the Wedgewood potteries that helped to foot the bill for Charles Darwin. Today all this has been drastically reversed. We have endless financial resources for science and technology; but we are not sure that we can afford the humanities.

The change in economics is related to a change in social status. A cultural anthropologist might remark that we have in our time a new priestly order. It is the scientists themselves who make up this new priesthood. The theoretical physicists are the chief priests; the research scientists are the monastic orders; the engineers are the secular clergy. And in our modern society it is believed that these new priests are the real possessors and administrators of the truth and of the power unto salvation. Except for the more relaxed morals naturally permitted to the secular clergy (the engineers), the lives of the other members of this priesthood are marked by austerity and asceticism. They have, moreover, a universal language—not Latin but mathematics—which they use in their more recondite communications with one another, and also as a device to overawe the minds of the vulgar. The fact that biologists at present rate rather low in the hierarchy is but a circumstance of the moment and need not be taken as reflecting the eternal order of things.

Furthermore, the kind of dogmatism in our time that threatens the freedom and integrity of the intellect is as often scientific as religious in its pretensions. A name for this new dogma is scientism. It is true that few professional scientists subscribe to the tenets of this faith. But there is an abundance of philosophers and of social scientists to develop its doctrine, to round out its system, and to proclaim its evangel. In the past century there was an intimation of the new spirit in the way in which Weisman spoke of the *All-macht* of the principle of natural selection. But it had its most impressive fulfillment in Herbert Spencer's evolutionary system, which was intended as a sort of scientific *Summa* to replace the unscientific *Summa* of Aquinas. In retrospect it is curious to note that this confident dogmatist spoke of himself as an agnostic—i.e., one who does not know. To us it is fantastic how much he claimed to know and to understand perfectly. George Eliot once asked him how a man who did as much thinking as he did could have so few wrinkles on his brow. He replied: "I suppose it is because I am never puzzled."

In retrospect, moreover, we are reminded that the principal and truly perilous opposition to Darwin's teaching came, not from the clergy, but from the scientists themselves. To see the evidence for this it is not necessary to go beyond the *Autobiography and Letters* as edited by the son, Francis Darwin. Charles Darwin himself records that he got no encouragement in advance when he broached to a few friends the idea of questioning the fixity of the species. It is true that at the critical moment Hooker, and above all Thomas Huxley, stood forth as his champions. But the famous Lyell did not come around until eight years after the publication of *The Origin of Species*, in the tenth edition of his *Principles*. Adam Sedgwick in geology reported that he read the book with more pain than pleasure; Agassiz at Harvard commented on it, "Poor, very poor"; J. W. F. Herschel, the astronomer, said that natural selection was the "law of higgledy-piggledy." The London Entomological Society was practically unanimous in rejecting the thesis. And the French Academy of Sciences was as scandalized by the lack of clear and distinct ideas as it was shocked by the disrespect for clear and distinct species. As for Bishop Wilberforce, who led the rhetorical assault on *The Origin of Species*, it was believed that he was put up to the job by Sir Richard Owen, the greatest anatomist in England, who was

opposed to all this new-fangled theory, but had not the audacity nor the skill to attack it in public.

The most radical confusion of issues, however, results from the discovery that Charles Darwin owed a central insight to a theologian and his theology. Both Darwin and Wallace made generous acknowledgment of their indebtedness to Malthus for the portrayal of the struggle for existence with its consequence in natural selection. At this point we might say that Darwin actually developed a capitalistic biology. First with the help of Malthus, and then with promptings from Spencer, he saw the natural scene as one of free competition with an outcome in the survival of the fittest. Here it is interesting to speculate what might have been the turn of Darwin's thought if he had chanced to read some of the utopian socialists instead of one of the orthodox apostles of laissez-faire. Later critics, indeed, were to remark that he accentuated the role of competition to a disproportionate degree, and that a balanced view of evolution must see co-operation and competition as polarities in one process.

But what has not been remarked heretofore, I believe, is the fact that Malthus, though an Anglican clergyman, was thoroughly Calvinist in his theology. Indeed if we were to choose just one work out of all the classics in political economy to exemplify best the application of Calvinist principles to the social sciences, that one work would have to be the seventh edition of the *Essay on the Principle of Population*. To get from this to Darwin we simply keep the picture of the severity of the struggle for existence, with an identical doctrine of an élite that emerges from the struggle; we translate predestination into determinism, and, with a change of just one letter, alter (divine) election to (natural) selection. Metaphysicians might want to debate whether it is God or Nature who is running the show; but for those of us who are the mere creatures of the transaction, the only real alternatives are of survival or salvation, or of destruction or damnation—with the odds heavily in favor of the latter. In brief, Darwin gave us a Calvinistic biology.

III.

It is of value, nevertheless, to ignore for the moment these confusions of the issue between Darwinism and Christianity, and to

ask what kind of threat the new biology at first seemed to pose against traditional religion.

One immediate consequence was a heightening of the anti-clerical disposition in philosophy. In Thomas Huxley, who liked to call himself *episcopophagous*, bishop-eater, this was friendly enough. But it takes on the character of the ludicrous when we read, in John Dewey's essay on "The Influence of Darwin on Philosophy," the statement: "There is not an instance of any large idea about the world being independently generated by religion." Suppose we ignore the "independently," since the claim to independent generation of a "large idea" cannot be made by any human enterprise whatsoever. But one must wonder if Dewey ever bothered to read the *Autobiography and Letters*. Did he know that Malthus was a clergyman, and that both Wallace and Darwin made acknowledgment to Malthus? Or was it too much to expect that Dewey should recognize in Malthus and in Darwin alike the radically Calvinistic ingredient? Anti-clericalism has its important functions in history; but, when it calls itself "empiricism" or "scientific method," and then resolutely refuses to face the facts, it has become something preposterous.

A deeper consequence of Darwin's work, however, was, as his wife Emma perceived, that it seemed to have the effect of "putting God farther off." Providence might still be there, but it was getting too remote. So Darwin's beloved teacher, Adam Sedgwick, a clergyman and a geologist, cried out that *The Origin of Species* was a "dish of rank materialism cleverly cooked and served up merely to make us independent of a Creator." Darwin himself remained a good theist throughout the voyage on the "Beagle"; but, as he reported later, there was a kind of creeping agnosticism implicit in his scientific doctrines: "Thus disbelief crept over me at a very slow rate, but was at last complete. The rate was so slow that I felt no distress."

It is to the credit of the fundamentalists in religion that they are often sharper and more rigorous in their logic than the modernists. The "monkey law" of Tennessee merely agreed with Darwin in affirming that his theory must rule out a separate act of creation for man. At the trial, B. G. McKenzie put it crudely but concisely: the effect of Darwinism would be to have Genesis say that God

"issued some sort of protoplasm, or soft dish rag, and put it in the ocean and said, 'Old boy, if you wait around 6,000 years, I will make something of you.'" William Jennings Bryan caught the menace of this creeping agnosticism when, writing *In His Image*, he attacked the Higher Criticism as an ally of Darwinism:

> The higher critic is more dangerous than an open enemy. The atheist approaches you boldly and tries to blow out your light, but, as you know who he is . . . you can protect yourself. The higher critic, however, comes to you in the guise of a friend and politely inquires: "Isn't the light too near your eyes? I feel it will injure your sight." Then he moves the light away, a little at a time, until it is only a speck and then—invisible.

A related consequence of Darwinism was that it seemed to strike at the religious roots of morality. This did not always trouble Charles himself, since he felt assured that the Moral Law, like the British Empire, girdled the globe. But as the daughter Henrietta tells us, it bothered his wife Emma who, like Tennyson and Arnold, felt a "sorrowful wish to believe more," yet held onto the moral residue as "her perfect unselfishness and active goodness gave her rest, peace, and happiness." Charles himself, nevertheless, came to be aware that certain sensibilities in his own nature were becoming atrophied as he became "a withered leaf for every subject except Science." He was now "too dried up" in soul to appreciate music and poetry as he once did, and began to wonder if "the loss of these tastes" might "possibly be injurious to the intellect, and more probably to the moral character, by enfeebling the emotional part of our nature."

But it was Thomas Huxley who had to face the issue on the level of socially responsible action as he served on the school board. To the great delight of his clerical colleagues he insisted on the use of the Bible in public instruction. Was not the Bible, after all, a kind of "national epic"—an English epic, that is—and what would happen to English character without it? Huxley's American pupil, Henry Fairfield Osborn (research professor of zoology at Columbia University, President of the American Museum of Natural History), himself a devout but liberal Christian, gives us a direct quotation from Huxley on this issue: "I must confess I have been no less seriously perplexed to know by what practical measures *the religious feeling, which is the essential basis of conduct*, was to be kept up, in

the present utterly chaotic state of opinion, without the Bible." But while Huxley was all for the Bible, and Matthew Arnold could write and congratulate him on appreciating "the charm and salutariness of J. C." (i.e., Jesus Christ), this was already the Bible without God and Christianity without Christ. And pretty soon a Balfour, in *The Foundations of Belief*, would be asking if the moral principles could long survive when the religious convictions supporting them were already in decay.

However, the most powerful impact of Darwinism was that it seemed to reduce man to a mere animal. This was foreshadowed in *The Origin of Species* and became explicit in *The Descent of Man*. Wallace tended to hold back at this point, but Darwin, who still had a very strong sense of human dignity, seems not to have had too much trouble with it. He managed it, I believe, with all his sensitivity in ethics, by noting the beastliness of which men are capable and the nobility of which animals are capable. Looking upon the savages of Tierra del Fuego, he asked himself in horror: "Could our progenitors have been men like these? Men whose very signs and expressions are less intelligible to us than those of domesticated animals." If this much could be managed, then why not the rest? So it was with real conviction that he entered into the peroration of *The Descent of Man* with this rhetorical flourish:

> For my part I would as soon be descended from that heroic little monkey, who braved his dreaded enemy in order to save the life of his keeper, or from that old baboon, who descending from the mountains, carried away in triumph his young comrade from a crowd of astonished dogs—as from a savage who delights to torture his enemies, offers up bloody sacrifices, practices infanticide without remorse, treats his wives like slaves, knows no decency, and is haunted by the grossest superstitions.

But no matter how decently Darwin might dress it up, this new ancestor of man—"a hairy, tailed quadruped, probably arboreal in its habits," itself derived from some ancient marsupial, which in turn has come from some amphibian-like creature, and that from some fish-like animal, all the way back to the likeness of the larvae of existing marine Ascidians—this new ancestor, as William Jennings Bryan clearly saw, was hardly a creature made in the image of the creator God. Indeed, was not God, somewhere along the way, evaporated into Haeckel's "gaseous vertebrate"? Was not morality

dissolved into the brute struggle for the might which alone can define the right? And was not man, in his new heritage of beastliness, suddenly stripped of as much spiritual significance as might make him worthy even to be cast into hell?

IV.

If after the lapse of one hundred years we ask what has been the development of these threats to traditional religion, we shall find that the consequences are again confused. Their uncertain quality is derived in part from an initially uneven merit, and in part from the way in which both Darwinism and Christianity interact with other social forces in the course of a century.

I cannot answer for England or for other countries, but in this year 1959 it would be inaccurate to complain of an anti-clerical temper in the United States. Not only is religion back in the good graces of the people; it has even become intellectually respectable. At any rate we have played through, and have done with the farce of the hard-headed empiricist who will examine all the facts of life except those that bear upon man's deepest faith, and hope, and love. Historians, sociologists, and psychologists are especially aggressive in their inquiries, with the philosophers, however, still jigging about the periphery of the enterprise in a gingerly manner. But what is really novel today is that both priestly orders—those of religion and those of science—appear to enjoy an equal prestige. The proof of it lies in the way either a distinguished physicist or a distinguished theologian may utter *ex cathedra* opinions on anything from foreign policy to Christian Dior to Jesus Christ and get a respectful hearing. A few of the old-timers among the capitalists will recollect that this used once to be their unique privilege. The rest of us may wonder whether or not it may be time for the rise of a new anti-clericalism which shall purge the pride of the priests temporal and spiritual.

On the prime threat to doctrine—"putting God farther off"—it may be said that theology had a complete triumph. It was Asa Gray in New England who wrote an article in *Nature* insisting that Darwin's theory permitted us to have "Morphology wedded to Teleology." And in contradiction to what John Dewey reports in his essay, Darwin wrote back to congratulate Gray for being able

"to hit the nail on the head," and to declare "what you say about Teleology pleases me especially." However, the most dramatic reconciliation of God with evolution was accomplished by Henry Drummond in his *Natural Law in the Spiritual World* (1883) and in *The Ascent of Man* (1894). In the latter volume he affirmed:

> The two are one. What is Evolution? A method of creation. What is its object? To make more perfect living beings. Through what does Evolution work? Through Love. Through what does Christianity work? Through Love. Evolution and Christianity have the same Author, the same end, the same spirit.

The man who wrote these words had served with Dwight L. Moody in Scotland, and was himself an evangelist of note. He also held the chair of natural science at New College, Edinburgh.

At this point we must insist that the cheerful rendering of the evolutionary process was quite congenial to Darwin. He complained of the problem of evil only when he was thinking about the deity. As a naturalist in philosophy he was very much in accord with the optimism of Herbert Spencer. Toward the end of *The Origin of Species* he could write (with my italics): "Hence we may look with some confidence to a secure future of great length. And as natural selection *works solely by and for the good of each being*, all corporeal and mental endowments will tend to progress toward perfection." Never was the gentle Charles a colleague of the bloodthirsty Darwinians. A kindly piety could easily harmonize with such a spirit, and the optimistic theology of evolutionary immanence was to become standard for liberal Christians for over half a century. Indeed so completely was the deity domesticated in this new world of biological science that Karl Barth and the Neo-Orthodox thinkers made it their chief task to rip God out of nature, and once again to put him farther off in a remote and aweful and unintelligible transcendence.

But what are we to say to the pulling up of the religious roots of morality? The plain fact is that today there is no noticeable belief in a universal moral law. We are historical relativists, cultural relativists, ethical relativists. Classical humanism from the Greeks to Spencer and Mill always believed in that moral law. So did classical atheism from Lucretius to Holbach. But today neither the positivists nor the existentialists will have anything to do with it. William

Jennings Bryan sensed this rising relativism at the time of the Scopes trial. Said he: ". . . 'we may well suppose' is not a sufficient substitute for 'Thus saith the Lord.' " The interesting thing today is that our humanists, no longer sharing the great eighteenth century faith in the authority of Nature, Reason, and Humanity, will for the most part agree that all we have left in ethics is a "we may well suppose." At their very best morals are an "emotive" affair.

Of course ethical relativism in practice does lead to a kind of inverted moral law—the law that might makes right. Only the inhabitants of a fat and prosperous society could ever imagine that we can get along with "live and let live," and with everybody's doing just as he pleases. Moreover, the doctrine that might makes right was one that Nietzsche and others thought that they could extract from the Darwinian teaching. They would have to do it, of course, in spite of the intent of Charles Darwin himself. For when Darwin first came to converse with the English Nietzsche, the Christian Nietzsche—Thomas Carlyle—he was much impressed by the man; but later on he noted that what Carlyle really worshipped was power, and Charles would have none of it. Nevertheless it was the great achievement of this gentle Charles Darwin in biology that would help to destroy the religious foundations of morality, and to give scientific respectability to the ancient and evil ethics of Moloch.

Finally, for the descent of man to the animal kingdom, rather than his ascent from it, today it would seem that we are making an heroic effort to do honor to our ancestors. In the wake of Darwin's achievement there have come all sorts of animal anthropologies. There are studies in diet, race, sex, glands, heredity, population. There are programs in eugenics, or in social Darwinism. There is instinct psychology, genetic psychology, functionalism. There are the assorted morphs, meso-, endo-, ecto-. There are all the experiments on animals—cats, canary birds, chickens, dogs, rats, monkeys—intended to reveal to us the more basic truths of human nature. And there is at last an Alfred Kinsey, with his cult of the "biologic"—a sort of fundamentalist in science, who differs crucially from Darwin in this respect that, with all his laborious inquiries and researches, Kinsey has always been careful never to ask the humanly significant question.

Bryan already saw something like Kinsey on the horizon when, at the Scopes trial, he railed against an article on sex in the *Journal of Social Forces*. In his grandly rhetorical way he struck at the essential: "Talk about putting Daniel in the lion's den. How dare those scientists put man in a little ring like that with lions and tigers and everything that is bad! . . ." This still sounds funny to us, until later on we read Bryan's protest against putting "man with an immortal soul in the same circle with the wolf, the hyena, and the skunk." And then suddenly we realize that this is precisely what much of current literature does with man. Only our kinship with the animals is no longer through Darwin's "heroic little monkey" or courageous "old baboon." It is, as Tennessee Williams so vividly demonstrates, and as Bryan foresaw, with "the wolf, the hyena, and the skunk."

V.

It is in deference to the spirit of Charles Darwin, however, that we seek to bring this essay to a close with what he insisted upon in the novels that his wife read aloud to him, and what he desperately attempted, in spite of the evidence, to give to *The Origin of Species*—a happy ending.

The first point is difficult to encompass in a paragraph. It is the new awareness of the basic kinship between the categories of Hebrew thought and the categories of the evolutionary philosophy. The one or the other interprets reality as a field for the play of dynamic history or of dynamic development. The new categories are more existentialist than essentialist; they are Hebraic rather than Hellenic. They are Biblical and Darwinian, rather than Greek and Newtonian. They are united in insisting on the "variations," individual and social, that appear in history and in nature, and in repudiating those pretentious chaps whom Darwin stigmatized as the "systematists." This is not Tillich's world of Being. It is the world of which Reinhold Niebuhr speaks in *The Self And The Dramas Of History*. Right now this particular exchange between science and religion is barely started, but it promises to be a most fruitful one.

The second point expresses an increasing awareness that religion and science differ in their focus of interest. One is the great art of

ends; the other is the great art of means. What should be the goal of life? What are the mechanisms that make it possible?—these two questions are related as are the functions of the pilot and of the engineer on a ship. And the critical issue is not how to reconcile the craft and the lore of the pilot with the craft and the lore of the engineer: though these two crafts must always exist in creative tension with one another. The critical issue today is to what end should our mighty energies be used; in the service of what sort of religion may science be enlisted?

Butterflies

By JAMES LEIGH

That first maidenhead spring
in Massachusetts brought them in a swirl,
like blameless yellow vanities, most unPresbyterian.
More than children wore the thought of them
like bright forbidden badges.

Fretting past polished glass,
they seem perverse infractions of some law:
the autumn reel run backward, quicker and re-tinted.
Dry October yellow is less unnerving,
falling leaves more true.

Austere rivers of wind
will wash them into empty skulls of buildings;
children will guess their yellow exits and will chase them
out of the boring prehistoric ruins
into the lavish sun.

JAMES LEIGH, Stanford graduate student and professional jazz musician, had a poem in our last issue and has another one on page 68 of this issue.

Darwin and "Social Darwinism"

By GEORGE E. SIMPSON

■ Like Holy Writ, Darwinism is susceptible to many interpretations. Aristocrats and democrats, Marxists and racists, militarists and pacificists, social scientists and biological scientists have read and re-read, interpreted and re-interpreted Darwin.

In *The Origin of Species* Darwin attributed the diverse forms of life and the evolution of complex animals from simpler ones to "a Ratio of Increase so high as to lead to a Struggle for Life, and as a consequence to Natural Selection, entailing Divergence of Characters and the Extinction of less-improved forms." In *The Descent of Man* he thought that the "ape-like" progenitors of man, like other animals, must have tended to increase beyond their means of subsistence and thus to have been involved in a struggle for existence and to the "rigid law of natural selection." Groups composed of the largest number of individuals possessing physical variations best adapted for gaining subsistence or for defending themselves would survive in greater numbers and produce more offspring than groups less well-endowed.

In dealing with the struggle for existence in early human tribes, Darwin acknowledged the influence of the physical nature of the country, and he attributed some importance in this struggle to the size and stature of the men. Greater importance, however, was given to intellectual powers (which, he said, tend to be inherited), to superiority in the arts, and to social and moral qualities. Such faculties as sympathy, fidelity, and courage were held to have been acquired through natural selection, "aided by inherited habit."

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Kropotkin contended that Darwin's followers, including Herbert Spencer and T. H. Huxley, "reduced the notion of struggle to its narrowest limits." Huxley's paper on the "Struggle for Existence and Its Bearing Upon Man" stated that among primitive men, as among animals, "the weakest and stupidest went to the wall, while the toughest and shrewdest, those who were best fitted to cope with their circumstances but not best in another way, survived. Life was a continuous free fight, and beyond the limited and temporary relations of the family, the Hobbesian war of each against all was the normal state of existence."[1]

Early Social Darwinism

The application of Darwin's principle of natural selection to human society, with special emphasis on competition and struggle, became known as "Social Darwinism." This doctrine, congenial to the intellectual climate of the end of the nineteenth century, was endorsed by the advocates of unrestricted competition in private enterprise, the colonial expansionists, and the opponents of voluntary social change. Among others, Ernst Haeckel provided scientific sanction for this point of view.

> The theory of selection teaches that in human life, as in animal and plant life, everywhere and at all times, only a small and chosen minority can exist and flourish, while the enormous majority starve and perish miserably and more or less prematurely. . . . The cruel and merciless struggle for existence which rages through living nature, and in the course of nature *must* rage, this unceasing and inexorable competition of all living creatures is an incontestable fact; only the picked minority of the qualified fittest is in a position to resist it successfully, while the great majority of the competitors must necessarily perish miserably. We may profoundly lament this tragical state of things, but we can neither controvert nor alter it. "Many are called, but few are chosen." This principle of selection is as far as possible from democratic; on the contrary it is aristocratic in the strictest sense of the word.[2]

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[1]Quoted in P. Kropotkin, *Mutual Aid*, New York, McClure Phillips & Co., 1902, p. 4. (Huxley's paper was published in 1888.) George Nasmyth (*Social Progress and the Darwinian Theory*, New York, G. P. Putnam's Sons, 1916, p. 33) points out that Huxley wrote of ethical factors and limits to the struggle in later periods of history.

[2]Ernst Haeckel, "Freedom in Science and Teaching," p. 93. Quoted in George Nasmyth, *op. cit.*, p. 6.

Herbert Spencer and William Graham Sumner were prominent in advancing the doctrine of the social Darwinists. Despite differences in their philosophies, both saw the poor as the "unfit." Because they are the result of the operations of the laws of evolution, they cannot be assisted and efforts to help them through legislation, public charity, and social reconstruction are evil.[3] According to Spencer, "The whole effort of nature is to get rid of them, and make room for better. . . . If they are sufficiently complete to live, they *do* live, and it is well they should live. If they are not sufficiently complete to live, they die, and it is best they should die."[4]

Although Darwin pointed out that militarism and war occasion reverse selection by exposing the biologically soundest young men to early death or preventing them from marrying during the prime of life and, at the same time, by providing those with poorer constitutions with greater opportunity to marry and propagate their kind, many of the social Darwinists praised war as a means of furthering social progress. Among these, one of the most influential was Ludwig Gumplowicz, Austrian jurist and sociologist. In his doctrine, social and cultural evolution was due solely to the struggle of social groups, with inter-group war functioning socially as the struggle for existence and the survival of the fittest function in the case of individuals.[5] An English scientist, Karl Pearson, wrote: "History shows me one way and one way only, in which a high state of civilization has been produced, namely the struggle of race with race, and the survival of the physically and mentally fitter race. If men want to know whether the lower races of man can evolve a higher type, I fear the only course is to leave them to fight it out among themselves."

Nineteenth century imperialists, calling upon Darwinism in defense of the subjugation of "backward" races, "could point to *The Origin of Species* which had referred in its sub-title to *The Preserva-*

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[3]John W. Bennett, review of Richard Hofstadter, *Social Darwinism in American Thought*, University of Pennsylvania Press, 1944, in *American Anthropologist* 47 (1954), p. 448.

[4]Herbert Spencer, *Social Statics*, New York, D. Appleton & Co., 1864, pp. 414-415.

[5]Howard Becker and Harry E. Barnes, *Social Thought from Lore to Science*, I, 2nd ed., Harren Press, Washington, D.C., 1952, p. 713.

tion of Favored Races in the Struggle for Life. Darwin had been talking about pigeons but they saw no reason why his theories should not apply to men, and the whole spirit of the naturalistic world-view seemed to call for a vigorous and unrelenting thoroughness in the application of biological concepts."[6] Darwinian theory was utilized to justify the conflicts of rival empires, the ententes and the alliances of the "balance of power." Bismarck in Germany, Chamberlain in England, and Theodore Roosevelt in the United States found in social Darwinism a sanction for their theories of force and expansion.

Another aspect of social Darwinism at the turn of the century was the eugenics movement. Like other early social Darwinists, the eugenicists equated the "fit" with the upper classes and the "unfit" with the poor. Believing that disease, poverty, and crime are due largely to heredity, they warned against the high reproductive rates of the lower classes. As Hofstadter shows, they differed from earlier social Darwinists in that they failed "to draw laissez-faire conclusions, and depended for a part of their own program upon state action."

Was Darwin a Social Darwinist?

Students of Darwin's work are divided on the question of whether he was a social Darwinist. Hofstadter remarks that "there was nothing in Darwinism that inevitably made it an apology for competition or force. Kropotkin's interpretation of Darwinism was as logical as Sumner's." George Nasmyth, a pacifist who popularized the work of Kropotkin and of Jacques Novicow, went further and claimed that social Darwinism was founded upon "a gross distortion of Darwin's own theory of social progress." Nasmyth contrasted Darwin's theory of society, "held together from within by the cementing power of the moral sense and social instincts," with "the philosophy of force, as represented in the sociology of Spencer, Ward, and Ratzenhofer, in which society is held together only by the external force exerted by some other society, this society having been constituted and held together in some miraculous way." Nasmyth goes so far as to say that "the inclusion of the entire human race within the bounds of the moral law—the federation of the world—be-

[6]R. Hofstadter, *op. cit.*, pp. 146-147.

comes, therefore, in the true Darwinian theory, the ultimate goal of human evolution. He felt that Darwin had exposed the harsh reasoning of those who attributed social advance to competition, war, and opposition to reform. Asserting that Darwin had emphasized the importance of charitable actions, he added that such actions "tend to take the form in modern legislation of old age pensions, mothers' pensions, sickness and accident insurance and other social measures. . . ."

Other scholars have reached an opposite conclusion. Sweezy thinks the evidence that Darwin gave "the sanction of his great reputation to the reactionary doctrines now associated with his name under the term social Darwinism" is unmistakable.[7] As proof he cites this passage in *The Descent of Man*:

> With savages, the weak in body or mind are soon eliminated; and those that survive commonly exhibit a vigorous state of health. We civilized men, on the other hand, do our utmost to check the process of elimination; we build asylums for the imbecile, the maimed, and the sick; we institute poor-laws; and our medical men exert their utmost skill to save the life of everyone to the last moment. There is reason to believe that vaccination has preserved thousands, who from a weak constitution would formerly have succumbed to small-pox. Thus the weak members of civilized societies propagate their kind. No one who has attended to the breeding of domestic animals will doubt that this must be highly injurious to the race of man.

Bernhard Stern quoted the following passage from the same work in his claim that Darwin subscribed to the eugenic creed:

> The advancement of the welfare of mankind is a most intricate problem; all ought to refrain from marriage who cannot avoid abject poverty for their children; for poverty is not only a great evil but tends to its own increase by leading to recklessness in marriage. On the other hand, as Mr. Galton has remarked, if the prudent avoid marriage while the reckless marry, the inferior members tend to supplant the better members of society.

According to Stern, such a view applies natural selection mechanically to man, disparages the contribution of preventive medicine, and attacks the poor laws "as coddling the poverty stricken who are identified as inferior stock."[8]

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[7]P. Sweezy, "Social Darwinism," *Science and Society*, 6 (1942), p. 76.

[8]Bernhard Stern, "Social Darwinism," *ibid.*, p. 76.

While Geoffrey West thinks that Darwin himself was more elastic in his view of natural selection than most of his interpreters, "the effect of his treatment of the Struggle is infinitely more one of competition than co-operation. . . . Popular Darwinism may be a crude but it is scarcely an unfair or inaccurate presentation of the broad effect of Darwin's basic writings."[9]

Although he calls attention to passages in *The Descent of Man* which emphasize the role of the co-operative spirit, Sir Arthur Keith expresses surprise that Darwin took "the action of his law of Natural Selection in bringing about the extermination of the less civilized by the more civilized peoples in such a spirit of indifference."[10]

To the present writer, Montagu's appraisal of Darwin's position seems judicious.

> If it is true that the appeal to Darwinian theory for support of a social system based on ruthless competition and exploitation of colonial peoples represents a misinterpretation of evolutionary theory, the conclusion seems inescapable that Darwin himself was the first to make this misinterpretation. The few passages in which Darwin mentions altruism and cooperation come exclusively from *The Descent of Man*, where in a book of a thousand pages they are virtually crowded out by numerous statements that appear to stand in direct and unequivocal contradiction to them.[11]

Social Darwinism in Recent Years

Adolf Hitler's racism and Nazism have been called perversions of Darwinism. Hitler's virulent doctrines were the culmination of a half-century of social Darwinistic thinking in Germany. One of his most influential immediate predecessors was General Friedrich von Bernhardi, who said of the Germans that "no nation on the face of the globe is so able to grasp and appropriate all the elements of culture, to add to them from the stores of its own spiritual endow-

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[9]Geoffrey West, *Charles Darwin*, Yale University Press, 1938, pp. 327-328.

[10]Sir Arthur Keith, *Darwin Revalued*, London, Watts & Co., 1955, p. 264.

[11]Ashley Montagu, *Darwin, Competition, and Cooperation*, Henry Schuman, 1952, p. 96. On page 132 of this work, Montagu says that Nasmyth "errs in claiming Darwin not to be a Social Darwinist."

ment, and to give back to mankind richer gifts than it received."[12] Inspired by Heraclitus, Goethe, Treitschke, Frederick the Great, Clauss Wagner, von Schlegal, Schiller, and Clausewitz, Bernhardi glorified war as a biological necessity, as the greatest factor in the furtherance of culture and power, and claimed that the Germans could fulfill their great and urgent duty toward civilization only by the sword.

Hitler's doctrines are so well-known that extended reference to them here is unnecessary. According to *Mein Kampf*, the "Aryan" alone "furnishes the great building-stones and plans for all human progress," the Aryan had subjugated "lower races" and made them do his will, the Jew's "intellect is never constructive," "the mingling of blood . . . is the sole reason for the dying-out of old cultures," and hyperindividualism had cheated Germany of world domination and a peace "founded on the victorious sword of a lordly people. . . ." Hitlerism represents the most extreme variety of social Darwinism and the one which has had the most powerful effects on the destinies of modern peoples.

Echoes of social Darwinism are found in some of E. A. Hooton's writings. During World War II he wrote:

> Now if there is anything which can complete the ruin of the human animal which has been victimized by the machine, it is public charity and institutionalized care. . . . The reason why medicine has worked such biological havoc in civilized society is that it is coerced and intimidated by an imbecilic manifestation of humanitarian policy, which demands that human life be regarded as sacred. . . . The great European democracies, France and England handled this postwar anthropological situation with the same humanitarian stupidity which is a consistent policy of the United States. . . . They listened to the voices of the proletariat and allowed themselves to be weakened further by governments of socialistic and communistic incompetents who preached economic and personal equality and worshipped worthlessness. . . . We must rid ourselves of the false prophets of cultural salvation and witless preachers of human equality. . . . The future of man is dependent on biology. We must have fewer and better men, not more morons and machines.[13]

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[12]F. von Bernhardi, *Germany and the Next War*, New York, Longmans, Green & Co., 1914. Originally published in 1912.

[13]E. A. Hooton, *Why Men Behave Like Apes and Vice Versa*, Princeton University Press, 1940, pp. xvi-xix, xxv.

More recently, W. H. Sheldon's studies of constitutional types have included social Darwinistic views on race and war.[14] According to Sheldon:

> We begin to see in what burgeoning may actually consist. As I use the concept, it refers to a gross enlargement of structure which *does not serve a biological purpose, but may be inclined, rather, to hinder the purpose it seems to serve.* The fatty burgeoning of the buttocks and thighs now so often observed in American Negroes, Jews, and to some extent in other stocks of both sexes, is quite possibly a product of biological counterfeiting not essentially unlike that reflected in the asthenic degeneracies. It is not uncommon to encounter in American cities Negro and Jewish women so grossly obese, and so burgeoned both laterally and to the rear that they require the whole of a bus or streetcar seat intended for two. But these are not the prolific producers of offspring whose biological efficiency in that department long ago set the jaws of the trap. These burgeoned women generally produce defective children or, when the burgeoning is extreme, none at all. There are many Negroes, and people of other breeds, whom our complex urban civilization seems to have swept so far from their biological moorings that they have lost the biological orientation necessary for distinguishing between real coin and the most grossly counterfeit article.

Sheldon claims that where conditions are "both soft and unregulated, our best stock tends to be outbred by stock that is inferior to it in every respect." He urges that we adopt

> the view that war is the cheapest way out of the mess we have got into. Grim, decimative war carried to the point of settling on a power basis the question of political organization of the planetary population. . . . Birth control movements, except when universally enforced by political power, constitute only another monkey trap. Since as yet a central political power has not been established for our time, any talk of birth control now is like pacifism. This is to build the second story of the house before the first.

An interesting type of social Darwinism in modern dress combines a knowledge of genetics with racism, mutualism, and a formula on race mixture. Citing the United States as "an experiment in the study of the values of races," C. D. Darlington attributes the strength of this country partly to genetic recombination between

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[14]W. H. Sheldon, E. M. Hartl, and E. McDermott, *Varieties of Delinquent Youth*, New York, Harper and Brothers, 1949, pp. 813, 836, 881.

diverse races but "also, perhaps even more, to the unrecombined diversity." He contends that

> from the point of view of supporting a population of human beings there can be no doubt that the white-plus-Negro society is more efficient than the Indian was or ever could be. And the disparity is still increasing. Why? A white society alone would probably be little more numerous than the whites in the mixed society. A Negro society alone, even if not cut off from all intercourse with whites (to judge from the experiment in Liberia) would certainly support far fewer Negroes than there are in the mixed society. The advantage of the white-plus-Negro society is that its two racially dissimilar elements are able and willing (although only just willing) to help one another. The American Indian has been found not to be able and willing to help the other two. Their capacity and his capacity are both, of course, racial and genetic. They are determined and limited by heredity.

People, like water and vinegar, Darlington says, are different. He believes that "the future of mankind rests with those genetically diverse groups, whether races or classes, which can practice mutual help and show mutual respect. Neither of these habits can be assisted in the long run by a make-believe of equality in the physical, intellectual and cultural capacities of such groups." In his view, all races and classes have something to contribute and a plea is made for (a) "a balance . . . between the genetically differentiated elements of every nation and of all the nations of the world," and (b) "a balance . . . between inbreeding and outbreeding.[15]

Criticisms of Social Darwinism

The Russian sociologist, Jacques Novicow (1849-1912), was one of the first writers to devote himself to the refutation of the doctrine that unmitigated struggle for existence is the chief factor in human progress. In Novicow's view, the struggle for existence becomes in human society primarily an intellectual rather than a physical type of conflict. He predicted that intellectual conflict within societies would increase, be accompanied by an increase of justice and sympathy and a decrease of hatred, and bring about the survival of the best individuals.

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[15]C. D. Darlington, *The Facts of Life*, Macmillan, 1953, pp. 292-294.

In 1902, Petr Kropotkin wrote of the two aspects of animal life in Eastern Siberia and Northern Manchuria which had impressed him most—the severity of the struggle for existence against a formidable Nature, and the absence of the bitter struggle for existence among animals of the same species in spots where animal life was abundant. Under the former conditions, the distinctive feature was under-population rather than over-population. Wherever he observed scores of species and millions of individuals (colonies of rodents, flights of birds, a migration of a fallow-deer), he saw mutual aid and mutual support which led him to conclude that this feature was highly important for the maintenance of life and the preservation and further evolution of each species. He saw further that when animals have to struggle mightily against scarcity of food (e.g., semi-wild cattle and horses, wild ruminants, squirrels), the portion of the species affected by the calamity "comes out of the ordeal so much impoverished in vigor and health that no progressive evolution of the species can be based on such periods of keen competition." Consequently, Kropotkin was unable to accept the view that the struggle for the means of subsistence, of every animal against all other animals of its own species, and of every man against all other men, was a natural law. Instead he was convinced that the practice of mutual aid has created the conditions of social life "in which man was enabled to develop his arts, knowledge, and intelligence."

Dobzhansky and Allen point out that natural selection in man comes about through the survival of the genetically fit, not of the genetically fittest. Calling Spencer's "survival of the fittest" an effective slogan in the campaign to get the theory of evolution accepted, they say it greatly overstated the fierceness of the struggle for existence.[16]

Ashley Montagu has called attention to the criticisms of one-sided Darwinism made by a number of outstanding modern biologists, including S. J. Holmes, Patrick Geddes, J. Arthur Thompson, George Gaylord Simpson, Theodosius Dobzhansky, Marston Bates, Warder C. Allee, William Patten, John Muirhead Macfarlane, Ralph Lillie, and Herman J. Muller. According to these scientists, co-operative forces are biologically more important and vital than

[16]Theodosius Dobzhansky and Gordon Allen, "Does Natural Selection Continue to Operate in Modern Mankind?", *American Anthropologist*, 58, (August, 1956), p. 593.

struggle.[17] Attempting to resolve the competition-co-operation issue, Montagu writes:

> Competition of every kind exists in the state of nature and has, of course, played an important role in the evolution of the varieties of life, but so has co-operation. In the struggle for existence one group may be competitively more successful than another because it is more co-operative. Certainly, so far as the persistence or continuation of every group is concerned, natural selection favors the *co-operative* as opposed to the *disoperative* struggling for survival.[18]

The Present Status of the Concept of Natural Selection

The view that "life is a struggle for existence in which only the fit survive, the fittest being those who have whatever it takes to survive" has been called "the Darwinian fallacy."[19] The concept of natural selection has not been discarded, but it has undergone revision. While the process of combative competition and struggle may occasionally result in one type producing a larger number of surviving progeny than another, this is not always the case. If the selection is severe, the reserves of genetic variability are soon depleted.[20]

In the evolutionary sense, fitness means that one genotype leaves more surviving progeny than another in the same environment. According to Dobzhansky: "The superiority may result from the fact that individuals of one genetic type are stronger and more resistant to environmental hazards, and live longer than individuals of other genetic types. Or one type may be more sexually active or more fecund than another. Individual vigor and fecundity are not necessarily correlated, and a superior fecundity may compensate or even overcompensate for deficient vigor."[21]

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[17]Ashley Montagu, *Darwin, Competition and Cooperation*, pp. 48-69.

[18]Ashley Montagu, *The Direction of Human Development*, New York, Harper and Brothers, 1955, p. 27.

[19]Ashley Montagu, *Darwin, Competition and Cooperation*, pp. 17-18.

[20]T. Dobzhansky and Gordon Allen, *op. cit.*, p. 593.

[21]T. Dobzhansky, "Heredity, Environment, and Evolution," *Science*, vol. 111 (Feb. 17, 1950), pp. 164-165.

To J. B. S. Haldane the application of Darwinism to contemporary capitalist society would be that the poor are fitter than the rich because they leave more offspring behind them in each generation.[22] Replying to Mr. Haldane, Bernhard Stern called attention to the importance of social tradition (e.g., knowledge of birth control, influence of religious tradition, changing attitudes concerning family life) in determining family size.[23]

Darwin's opposition to birth control, on the ground that "overmultiplication was useful, since it caused a struggle for existence in which only the strongest and the ablest survived," seems outmoded. Geoffrey West remarks that now "intelligent birth control is as much a factor for survival as co-operation."

In shaping the genetic equipment of homo sapiens in the past, natural selection contributed to the development of culture. Culture has been such a successful nonbiological adaptive instrument that man has become specialized to live in man-made environments.[24] Despite the claims of the social Darwinists, social improvement seems to be due mainly to advances in technology and social organization rather than to breeding or selective elimination. Self-preservation is no longer a sufficient motive for living. Modern man determines what "the conditions and standards of a tolerable existence" are.[25]

In no human society has it been possible to breed genetic types selectively which would be adapted to different statuses. Societies change at different rates, but even during relatively stable periods social life is a complex matter. Those who show the greatest adaptability have an enormous advantage in meeting the demands of life in any type of society.[26]

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[22]J. B. S. Haldane, "Concerning Social Darwinism," *Science and Society*, 5 (1941), pp. 373-74.

[23]Bernhard Stern, "Reply on Social Darwinism," *Science and Society*, 5 (1941), pp. 275.

[24]T. Dobzhansky, "Evolution at Work," *Science*, 127 (May 9, 1958), p. 1097.

[25]David Bidney, "The Concept of Cultural Crisis," *American Anthropologist*, 40 (October, 1940), p. 546.

[26]A. Montagu, *Man's Most Dangerous Myth*, 3rd ed., Harper, 1953, p. 74.

While the present view of natural selection emphasizes the role of co-operation in the life of modern societies, competition is not held to be unimportant. Unmitigated competition and democracy are inconsistent, and democratic societies seek to make competition socially useful.[27]

Montagu remarks that regardless of whether competition "in its aggressive combative sense, ever had any adaptive value among men, which is greatly to be doubted, it is quite clear that it has no adaptive value whatever in the modern world." Homo sapiens may not survive, but if he doesn't, extinction will be due not to Nature but to his own devices, to his inability to adjust to a cultural world of his own creation.

Conclusion

One hundred years after the publication of *The Origin of Species*, and eighty-eight years after the appearance of *The Descent of Man*, natural selection remains an important concept in biology, anthropology, sociology, even in international relations. Modern man is subject to selection, natural and artificial. If this were not so, all human genotypes would produce surviving children in the same ratio as the occurrence of these genotypes in existing populations. Today the adaptive value of co-operation is more widely acknowledged and the role of ruthless aggression as a factor in the evolution of man, society, and culture is given smaller significance. Social Darwinistic thinking has not disappeared, but increasingly the "nature, red in tooth and claw" version of natural selection is regarded as an outdated brand of Darwinism.

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[27]On Célestin Bouglé's criticisms of the social Darwinistic arguments against democracy, see H. Becker and H. E. Barnes, *op. cit.*, II, pp. 846-847.

To an Artist to Take Heart

By NEIL WEISS

Failure snips the bliss of whales,
pings the crab's claw soft in web,
makes riven fish bounce to the spear,
bubble-blues the marble of the font,
tells the height of smoking funeral
or depth of coral's worn reversal,
is a hatch of husks, dear mellowing chess
with yourself, the clock always set
for noon when you pour out with rocks
and multitudes, reach for mail—
white flash of elbows malleate me!—
flesh faint and excoriate fading . . .
The ruse of movement everywhere
has you coming and going so fast
that you stop short, the dust flies off
and you hear the sound of music lost:
trumpets cling in the ear, cymbals
hold space, a drum reverberates,
cellos stay on infinite bass,
the piano's divided by a mace
into a solid roar . . . Better
move on from here. Remember this:
dig and strike a silver chest,
you do the same buttoning your vest.
Little is small, but small is great
and failure's another kind of success.
If they beat you enough, you get tough.
Once a man nailed to sticks climbed in the air,
said to us: Take it from here!

Poems by NEIL WEISS have appeared in many of the quarterlies and his first volume of lyrics, *Changes of Garments*, was published by the Indiana University Press in 1956.

Ecology ana Evolution

By W. FRANK BLAIR

■ Modern concepts in diverse areas of biological and geological science had their beginnings, or were at least foreshadowed, in ideas set forth 100 years ago in *The Origin of Species*. It is our purpose to examine the origins and evolution of one of the youngest fields of biological science, ecology (environmental biology), through a century of Darwinism and to consider the relation of this field to evolutionary theory.

Although environmental biology was not to emerge as a distinct and cohesive branch of biological science for another fifty years or more, the Darwin exposition stated a remarkable number of the ideas and problems of modern ecology.

The concept of the "struggle for existence," which stemmed from the earlier writings of Malthus, stands as an essential part of the Darwin theory. This same concept, under the shorter label of "competition," is central to much of ecological theory. For example, competition is a basic ingredient of the process of ecological succession, whereby pioneer communities pass through a series of successional stages that lead ultimately to a stable climax community. The organisms of each stage alter the environment to the extent that other kinds, with which they are unable to compete successfully under the altered conditions, move in and replace them. This con-

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tinues until a stable community of organisms that can compete successfully with any potential invaders is evolved. Modern ecologists have learned a great deal about competition among such small organisms as grain beetles and protozoans in the simple environments of laboratory culture dishes, but little is really know even today about competition in natural populations.

The regulation of numbers in natural populations was treated by Darwin in a section entitled, "Nature of the Checks to Increase." Emphasis was placed on the importance of climatic extremes and on predation in determining the average number of individuals of a species. Checks on "inordinate" increases in numbers through epidemics and parasites were also hypothesized. The question of how population numbers are regulated remains a lively issue of modern ecology. Proponents of the opposing theories of "density-dependent" and "density-independent" regulation of numbers continue their animated disagreement. In reality, the present controversy springs from the complexity of the problem, from the scarcity of knowledge of the dynamics of natural populations, and from the greater reliance on semantics than on accumulated facts by polemicists on both sides of the argument. In this hundredth year of Darwinism, the problem remains a challenging one for ecologists.

One of Darwin's greatest contributions to the future development of ecology was his recognition of the adaptation of organisms to their environment and of the co-adaptation of organisms for existence in a complex network of interrelations. His recognition of the nature and significance of adaptation is illustrated by his statement, "When we see leaf-eating insects green, and bark-feeders mottled-grey; the alpine ptarmigan white in winter, the red-grouse the color of heather, we must believe that these tints are of service to these birds and insects in preserving them from danger." Darwin wrote of the, "infinitely complex relations to other organic beings," and cited instances, "showing how plants and animals remote in the scale of nature are bound together by a web of complex relations." He saw co-adaptations in the dissemination of the mistletoe by the birds which are "tempted" to eat its fruit, and in the interrelations of insect-pollinated plants and their pollinators. His most frequently quoted example is that of the "chain" involving red clover, bumblebees which pollinate the clover, mice which feed on

the bumblebees, and cats which feed on the mice. "Hence it is quite credible that the presence of a feline animal in large numbers in a district might determine, through the intervention first of mice, and then of bees, the frequency of certain flowers in that district." Interdependence of organisms in a community is one of the fundamentals of modern community ecology.

Various other ideas basic to modern ecology are sprinkled through *The Origin of Species*. The concept of *biomass*, the by-word of the modern productivity school of ecologists, appears in the statement, "The amount of life (I do not mean the number of specific forms) supported on an area must have a limit, depending so largely as it does on physical conditions." The beginnings of the presently expanding field of ethology may be found in Darwin's chapter on "Instinct." In this he recognized that behavioral traits may be inherited, and he saw a mechanism for their modification and improvement in his theory of natural selection. The statement regarding inherited and learned behavior, "Fear of any particular enemy is certainly an instinctive quality, as may be seen in nestling birds, though it is strengthened by experience," might well have been written by a modern ethologist. The idea of ecological succession is clearly evident in the statement, "When an American forest is cut down a very different vegetation springs up; but it has been observed that ancient Indian ruins in the Southern United States, which must formerly have been cleared of trees, now display the same beautiful diversity and proportion of kinds as in the surrounding virgin forest." The principle of geographical speciation, accepted by a preponderance of modern students of evolution, is outlined in a section on, "Circumstances Favorable for the Production of New Forms Through Natural Selection." A section on "Dispersal During the Glacial Period," influenced by the writings of Sir Charles Lyell and Edward Forbes, treats the effects of Pleistocene glacial and interglacial climates on distributions of organisms. In present thinking, this phenomenon is regarded as a major agency in the speciation of many currently existing forms of plants and animals.

These details are only a part of the heritage modern ecology owes to Darwin. The development of environmental biology nevertheless lagged for several decades, principally because the stimulus of the Darwinian thesis was channeled into other areas of biology.

The first seventy-five years of Darwinism were the period of greatest flowering of the field of morphology. Comparative anatomy and embryology flourished as the newly converted Darwinians sought to find the missing links of evolution and thus to establish phylogenies. The attributes of living organisms and the relations of organisms to their environments were largely neglected until the beginnings of modern ecology in the first part of the present century.

It has been fascinating to trace many of the ideas of modern ecology back to Darwin's monumental work, but we have yet to touch on the great significance of his work in assaying the role of environment in evolutionary mechanics. To appreciate the broad significance of Darwin's contribution, it is necessary to know the philosophies of his time in respect to the origin of species. The conservative position was that of the special creationists, who held that species are immutable objects. This position was opposed by a growing number of transformationists who believed that species have arisen through the alteration of pre-existing species. Darwin's contribution did not lie in the refutation of the arguments of the special creationists (this was inevitable with the increase in knowledge of living and fossil organisms). His great contribution was not one of proving that evolution does occur; it was in presenting a mechanism for the transformation of species.

The intellectual climate of Darwin's time is characterized by the following quotation from the tenth edition of Sir Charles Lyell's *Principles of Geology*, written in 1867:

> But, speaking generally, it may be said that all the most influential teachers of geology, paleontology, zoology, and botany continued till near the middle of this century either to assume the independent creation and immutability of species, or carefully to avoid expressing any opinion on this important subject.

Among the strongest proponents of the immutability theory were the students and followers of the great French scientist, Cuvier. A generation earlier, Cuvier had devised the theory of catastrophism and successive creations to account for the fossil record he had observed in the Alps. The influence of his theory of catastrophism is still seen in the classical subdivisions of geological time. Faith in

the immutability of species was widely held by non-scientists for religious reasons, but various scientists and philosophers were searching for the causes of the transformation of species.

The one thing common to the theories of the pre-Darwinian transformationists was the vitalistic concept of some internal driving force that would lead to change. This group was under the influence of the romantic natural philosophy of the era, and various kinds of mystical forces were called upon to explain transformation of species. The most influential of the pre-Darwinian transformationists, both in his own era and subsequently, was Jean Baptiste Pierre Antoine de Monet, otherwise known as Chevalier de Lamarck. Lamarck's intuitive evolutionary theory as reviewed by Lyell envisions an innate tendency to progressive development which would lead in time to a graduated scale of being, "where the most insensible transition might be traced from the simplest to the most compound structure" if it were not for the intervention of external causes. The curious way in which these external causes were thought to promote modification is illustrated by the following passages, again quoted from Lyell's review:

> Thus otters, beavers, waterfowl, turtles, and frogs, were not made web-footed in order that they might swim; but their wants having attracted them to the water in search of prey, they stretched out the toes of their feet to strike the water and move rapidly along its surface. By the repeated stretching of their toes, the skin which united them at the base acquired a habit of extension, until, in the course of time, the broad membranes which now connect their extremities were formed. In like manner, the antelope and the gazelle were not endowed with light agile forms in order that they might escape by flight from carnivorous animals; but, having been exposed to the danger of being devoured by lions, tigers, and other beasts of prey, they were compelled to exert themselves in running with great celerity; a habit which, in the course of many generations, gave rise to the peculiar slenderness of their legs, and the agility and elegance of their forms.

Environment was assigned an important role in Lamarck's theory, as may be seen from the preceding passage, but it was an indirect one and operative only insofar as it was thought to influence the internal striving for perfection.

The Darwinian theory gained acceptance and has stood the test of increased knowledge because he correctly envisioned the interplay

of inherited variations and environmental (natural) selection. In Darwin's words, "multiply, vary, let the strongest live and the weakest die." The Darwinian contribution, then, was in substituting a mechanistic principle for vitalistic speculation in explaining organic evolution. Advancements in the field of genetics following the rediscovery of Mendelian inheritance in 1900 have established the case for inherited variations as one ingredient of organic evolution. Establishment of the fact that inheritance is particulate removed the most troublesome problem that Darwin encountered in assessing the role of variations in the mechanism of evolution. The concept of heredity in his time was one of blending inheritance, and he was confronted with the problem that new variants were presumed to be diluted through outcrossing. Mendelian genetics eliminated this problem by showing how variations could be stored in the population. On this one-hundredth anniversary of Darwinism, we see species as the result of the interplay of inherited characters and their environments. Students of evolution today are not concerned with proof of Darwinian evolution but in perfecting knowledge of the process. Advancement of such knowledge rests largely with those who combine the techniques and viewpoints of genetics and ecology.

After 100 years of Darwinism, we naturally have a much clearer picture of the nature of species and of species formation than Darwin had. However, this comes from the perfection of knowledge of hereditary mechanisms and of the functioning of natural selection rather than from any significant departure from Darwin's original thesis. Today, we know that any widely distributed species population is broken up into many subpopulations, each with its own pool of adaptive hereditary characters. Each pool is the result of selection by the local environment for characters that are adaptive to that environment. Variability is provided by gene mutations and chromosomal changes and by the tendency of individuals to disperse through the area occupied by the species. The tendency to vary is countered by the selective elimination of the least fitted in each of the many local environments in which the species lives. The least adapted leave fewer offspring and the best adapted leave more offspring and so predominate in succeeding generations. It is seen at once that this system provides a means whereby the species can continue

to exist in time in attunement with changing environments. Environmental change, then, inasmuch as it enforces alteration of the gene pool, operates as the major agency that promotes the change of existing species populations in time.

Some illustration of the preceding discussion is in order. Many kinds of small terrestrial animals such as rodents, lizards, insects have external colors that tend to match the colors of the soils on which they live as an apparent adaptation that conceals them from the animals which prey on them. Where soil colors change abruptly from place to place, as in the American Southwest, there may be a mosaic of strikingly different color races that correspond to their background soils, and extremes of these may exist only a few miles apart. One example is the white-throated packrat, which lives in rock desert areas in the Southwest. On the usual pale desert soils and rocks these packrats are pale gray in color, but in various places these rodents live on black basaltic lava beds, where their coat colors are black. The parallel development of these various black races is explained through selection on the lava beds for melanistic mutants that presumably occur throughout the population but are selected against on pale-colored rocks and soils. One of the most interesting of these populations lives in the Big Bend region of Texas, where the remnant of an extensive lava flow occurs as basaltic caps on whitish limestone buttes. The rats are variable, since there is local selection for both pale and dark rats depending on whether the limestone or the basalt is involved. The basalt cap is being weathered away, and eventually there will be nothing left but the pale limestones. By such time, we envision the virtual disappearance of the black coat color from the population and the replacement of the presently variable population by one that is uniformly pale gray.

The adaptation of geographical subpopulations of a species to local environmental conditions applies to physiological and behavioral attributes as well as to the morphological characters mentioned above. The deer-mouse breeds principally in spring and summer in the northern part of its range in the northern United States and Canada as an apparent adaptation that takes advantage of the relatively favorable weather and food supply at those seasons. The same species in the southern part of its range in Texas breeds in fall and winter as an apparent adaptation in avoiding the extreme

summer heat and the possible foot shortage during the dry season of the year. In the leopard frog, it has been shown that northern and southern populations have had their rates of embryological development adapted to such different water temperatures that they are inviable when cross mated.

Although its title might lead one to think otherwise, *The Origin of Species* dealt largely with arguments for the modification of pre-existing species rather than with the processes whereby the number of species is increased. Darwin did have some concept of geographical speciation as indicated by his brief discussion in Chapter Four on the effects of the subsidence of continental areas to produce island distributions and of subsequent emergence. Present thinking places great importance on geographical isolation as an initial stage in speciation. Fragmentation of the species range, as by a major climatic change that caused deletion of intervening populations, would result in separate breeding systems where there originally had been one. The geographically disjunct populations would then be embarked on independent evolutionary paths. Mutations that arose in one would not be available to the other, and, furthermore, the environments would not be exactly the same, so selection would promote differentiation of the separate gene pools. If the separation continued for a long enough time, the two populations would become sufficiently different that they would fail to interbreed if their ranges again came into contact, and there would be two species where originally there had been one. Even if some hybridization occurred when contact was re-established, natural selection should drive the speciational process to completion if the hybrids were at a disadvantage. Those individuals that make the mistake of mating with an individual of the wrong species would leave fewer offspring than those that mated within their species, and the factors that prevent cross mating thus would be strengthened by natural selection. In other instances, we know that previously separate populations have interbred freely on re-establishing contact and have thus undergone a halt in the speciational process.

In retrospect, the first half of the century of Darwinism belonged to the morphologists who made their contribution by reconstructing the story of organic evolution through the indirect evidence

of its morphological product. The geneticists made increasingly important contributions to knowledge of the mechanisms of evolution after about the middle of the century of Darwinism and continue to do so today. The ecologists followed somewhat later, and the prospects are that their contribution to the knowledge of evolutionary process and principle will be equally significant as they proceed with the study of natural populations of organisms in the environments in which they live.

As for the future, much remains to be learned about the precise details of the evolutionary process. The general theory stands strongly established after 100 years of testing, and the work of the last three decades has contributed much to the knowledge of the mechanics of the process. Future progress will inevitably involve increased precision in dealing with situations in natural populations. We need to know mutation pressures, immigration pressures, selection pressures, time elements and the like for populations in evolutionary stages. Evolution is occurring today, just as it has occurred in the past, and the great future of evolutionary studies lies in work with living populations in nature as natural evolutionary experiments.

In the Scrap Heaps of Man

By JACK MATTHEWS

The very small men and women
smashed, warped and wattled

immortal as butterflies
blasted in ignorance
shimmering in myriads

the survivals of plenitude
brain-spent, cretinous
frantic lickers of popsickles
hummers of trashy tunes

the eternally emergent
harboring despised da Vincis
in the pockets of their dirty loins

A Mother

By JACK MATTHEWS

It isn't until this restful evening
following her youngest son's marriage
that she begins to comb small spiders
out of her hair. The sun disintegrates
into a steaming rain . . . she gazes upon
a massive world without finch or robin
to spy tiny spiders. What gravity
can pull so heavily? A shard of moon
spins about her head . . . she sees stars
sticking to her fingers, the wind blackens
and still the numberless, innocent spiders
tumble numbly over her pale and naked arms
as she combs, with her eyes tightly closed.

JACK MATTHEWS' last appearance in the *Review* was with a poem, "The Awake," in the Spring, 1958, issue. His poems and stories have been published widely and two of his stories will be included in *The Chicago Review Anthology*.

Genetics and the Destiny of Man

By THEODOSIUS DOBZHANSKY

■ There is perhaps no problem more perplexing, and yet more inescapable, than that of human destiny. It was old and much debated when Darwin wrote *The Origin of Species*. A century later it is still a matter about which speculation abounds and positive knowledge is disconcertingly meagre; but Darwin, and Mendel after him, gave us the means of understanding how we became what we are, and our speculations can now be based on more knowledge and understanding. We may not yet know what life is, but we do know that all life, including man, is one, related by common descent.

The human body starts its existence as a fertilized egg cell, weighing about one-twentymillionth of an ounce. An adult is some fifty billion times heavier. The growth occurs through assimilation of food. Quite literally, man is a conglomeration of transformed groceries. And yet, this conglomeration is alive, feels joy and suffering, is conscious of self, and of the existence of other persons and of the Universe.

How is this possible? How can groceries be transformed to living matter? The nearest approach to an answer is that this transformation is brought about by the action of the genes which man has inherited from his ancestors. Chemical geneticists find that the genes are composed of a remarkable class of substances—deoxyribose nucleic acids associated with proteins, and that the genetic specificity, the genetic information, resides in the nucleic acids. Now, genes

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come only from genes. A gene somehow replicates itself, constructs its own copy from materials in its environment, ultimately from food. Self-reproduction is the basic property of life; we speculate that the first gene was also the first life. Those who take inordinate pride in the antiquity of their family lineages should be reminded that every man, and indeed every worm, is a direct descendant of the primordial protoplasm itself, which lived two billion or more years ago.

Whatever the primordial genes may have been, our genes are surely different. To a modern geneticist, evolution means that the genes underwent many changes, mutations, of their structure. The number of genes in a human sex cell is surmised to be of the order of tens of thousands, and each of these genes must be a product of æons of evolutionary development by successive mutations. Our biological patrimony, the human genetic equipment, man's genotype, has been shaped step by step, and gradually perfected, in the course of its evolutionary history. It is owing to this historical process that the genes which compose our genotype are articulated in a harmonious system. In suitable environments, human genes engender the development of a body which is a masterwork of orderly complexity and of apparent purposefulness.

We are confronted, however, with a fact which may seem to shake the theory of evolution by summation of mutational steps to its very foundations. Mutants observed in laboratories and experimental fields are usually detrimental to the organism. Many can be described as hereditary diseases or monstrosities, some are downright lethal, and others cause milder weaknesses or disabilities. The mutant Drosophila flies, which have served for almost half a century as materials for teaching genetics to biology students, are obviously a collection of freaks and cripples. Surely, changes of this sort could only result in degeneration, not in adaptation, of the organism to its environment. Here I can attempt no more than to indicate the broad lines of the argument which resolves the paradox of adaptive evolution issuing from apparently decadent mutants.

The argument is twofold. Firstly, the statement that a mutation is injurious or useful can only be meaningful if the environment in which the mutant lives is specified. An organism is fit or unfit with respect to its environment. Secondly, evolution is not simply the

summation of mutational steps, it is the accumulation of useful mutants. Only a tiny fraction of the mutants which arose in man's ancestry have eventually become constituents of the human genotype. Darwin concluded that hereditary variability becomes evolution if and when it is orientated by natural selection. In the language of genetics, mutation and sexual reproduction supply merely the raw materials from which evolutionary changes are shaped by natural selection. Evolution is a response of living matter to environmental opportunity. But the environment does not alter the genotype directly, as Lamarckists and a reactionary school which for a time wielded dictatorial powers over Russian biology wrongly thought. Environment presents challenges of opportunity, to which the organism may or may not respond by evolutionary alterations. Whether it does or does not depends upon the availability at the proper time and place of genetic variants which survive and reproduce in the new environments as well as or better than the ancestral type is capable of doing. Evolution is the outcome of a triangular encounter between environment, mutation, and selection.

As in Drosophila flies or in bacteria, mutants arise in man quite regardless of whether they may or may not be useful. In fact, most of them are harmful. But if the mutation process were suppressed evolution would eventually come to a halt. Selection favors the genetic endowments which make their possessors reproductively fit in existing environments. And yet, natural selection lacks foresight; it is as incapable at present of maintaining the genotypes which were useful to men of the Stone Age as it is powerless to evoke changes which will be helpful in the future Atomic Age. Only man could, if he so wished, supply the foresight which nature has failed to provide in evolution. To do so, it will be necessary to substitute a planned artificial selection for the unplanned natural one.

One aspect of this problem, and perhaps not the most important one, has in recent years engaged much public attention. This concerns the genetic damage which human populations are liable to suffer owing to the use and misuse of atomic energies. Some of the relevant facts are almost deceptively simple—deceptively because this very simplicity tends to gloss over serious gaps in our understanding. In 1926, H. J. Muller discovered that mutants appeared more often in the progenies of Drosophila flies treated with X-rays

than in untreated controls. Other investigators found X-rays mutation-inducing, or mutagenic, in all organisms which lend themselves to appropriate experimentation. Man is evidently not such an organism, but X-rays are beyond reasonable doubt mutagenic also in man. All so-called high-energy radiations, from softest X-rays to gamma rays, and presumably to cosmic rays, are mutagenic.

Furthermore, the incidence of induced gene mutations is simply proportional to the amount of the radiation reaching the sex cells. Therefore, as far as the genetic damage is concerned, there is no such thing as a safe or permissible amount of radiation. Physicists measure the radiation in so-called r-units, which refer to the numbers of ionization produced by the passage of the rays through a body. Now, a given number of r-units, no matter how small, will cause a proportionate genetic damage. The damage is independent of whether the radiation is received in a single burst, as from an atomic explosion, or gradually over years or decades, as from absorbed fallout products. This simple proportionality of the incidence of mutations to the radiation applied has been questioned, especially by non-geneticists. Indeed, the amounts of spontaneous radiation omnipresent in nature, owing to cosmic rays and to radioactive isotopes, are, except under special circumstances, of the order of three r-units per thirty years, the age which about corresponds to the middle of the reproductive life in man. Experiments on Drosophila have been made with from 25 to 8000 r-units, and on some bacteria from eight r-units upwards. With smaller dosages the experiments become prohibitively difficult. It is fair to say, however, that the direct proportionality rule describes the existing information so well that the burden of proof lies on him who would doubt it.

Our confidence vanishes when we ponder the fate of the mutants after they have been produced. Thus far, almost the entire attention of investigators has been concentrated on finding out how many mutations radiation induces. It can hardly be overstressed that we know woefully little about what happens to the mutants after they enter the genetic endowment of a living sexual population. True enough, mutants the effects of which are easily studiable produce at least some losses of fitness in the environments in which the species normally lives. Radiation-induced mutants are, if anything, more insidious and crippling than spontaneous mutants. And yet the

pioneer work of Gustafsson on barley, recently extended to other agricultural plants by several workers, has shown that some induced mutants increase the yield, at least when heterozygous. Radiation may turn out to be a powerful tool in breeding work. Agricultural plants are cultivated in environments quite different from those in which their ancestors lived; mutants useful to the agriculturist may be injurious to the plants if they lived in the state of nature.

Perhaps most regrettable is the dearth of information concerning the influence on fitness of mutants with individually small effects, of the so-called polygenes. Sharp discontinuous mutants in Drosophila and in man make beautiful examples of Mendelian inheritance, but their importance in evolution is relatively limited. Such traits as stature, weight, longevity, susceptibility to disease, and even skin-, hair-, and eye-colors in man, yield of milk, meat, eggs, grain, or the living mass in agricultural animals and plants, are conditioned mostly by gene complexes which are hard to analyze into separate gene components. Timofeeff-Ressowsky and Kerkis have independently shown more than two decades ago that X-ray treatments induce detrimental polygene changes in Drosophila. At first glance, this may seem to contradict the brilliant recent work of Bruce Wallace and of A. B. Burdick. Wallace's material consists of Drosophila flies which have been made, by means of special crosses, to carry two identical chromosomes of a certain pair. Such flies normally suffer a loss of vigor compared to normal outbred flies. Now, Wallace finds that the presence in such flies of one chromosome treated with X-rays gives a slight, but significant, improvement of their viability. Has Wallace shown that it is good for a population to be exposed to X-rays? Not at all! But what he has shown is important. It is that, under conditions of his experiments, the X-ray induced mutants are *on the average* increasing the viability of the flies when present in single dose, in heterozygous condition. There is good evidence that the same mutants would yield impaired viabilities when in double dose, in homozygous condition.

The existence of adaptively ambivalent mutants poses serious problems which only future investigations may solve. We do not know how frequent such mutants are in Drosophila populations, not to speak of human populations. If they are rare, then the ideal state of a population may perhaps be genetic uniformity, and the presence

of mutant genes would be simply a genetic load or a genetic burden, which we must try to minimize. But it may turn out that genes which produce hybrid vigor, or heterosis, are very frequent, and that our biological welfare depends upon our being multiply heterozygous. Surely, these are not alternative possibilities, and the adaptive optimum for man may be some intermediate state. I think that the best course is to admit that our understanding of the genetics of human populations is very sketchy, and it is most unwise to give a fictitious appearance of simplicity to this singularly complex matter.

Lest the above arguments be misinterpreted, I wish to state as emphatically as I can that they do not undermine the basic principle that any increase of mutation rates in human populations means an added increment of human suffering. The exposure of people to mutagenic radiations should be reduced to an unavoidable minimum. And this applies to exposure from fallout products of testing of atomic weapons, to X-rays employed in medical practice, and to the radiations to which peaceful uses of the atomic energies will inevitably subject increasing numbers of persons. Many of the discussions of the genetic risks from radiations, even by eminent scientists, display a curious aura of misplaced concreteness. Computations are made to show how many thousands of genetically handicapped persons will be born over many generations as a result of exposure to the radiation from fallout products. Yet some scientific pundits try to comfort us with the cheerful thought that this anguish and wretchedness will simply be superadded to the even greater amounts of misery which will arise from mutations not caused by the radiation effects. Testing of atomic weapons is said to be indispensable for preservation of freedom, hence sacrifice of thousands of innocents is justified. After all, in wartime millions of lives are considered expendable. But is not the really fundamental question whether preservation of freedom can be entrusted to those who would make and use atomic weapons?

Anyway, the problem of genetic damage by radiation should be viewed in proper perspective. In man, biological evolution has transcended itself. It has equipped mankind with genotypes which rendered possible the origin and evolution of culture. Culture is an adaptive instrument of immense potency; species other than man become adapted to their environments by changing their genes, man

changes his environments to conform to his genes. In man the evolution of life has reached a turning point; culture is superorganic, and cultural evolution has laws of its own. But it must not be forgotten that the superorganic has an organic basis, and neither human culture nor human genes are unalterable.

I think that we must definitely reject the notion that mankind has not changed genetically to any appreciable extent since the inception of the human cultural phase, one hundred thousand or more years ago. Human genes have been continuously patterned and re-patterned by natural selection, precisely because they made possible adaptation to the environment by means of culture. They bestowed upon our species the ability to communicate by means of symbolic language. Human genes have ushered in an increasing refinement of what Pavlov has termed the second signal system, concerned with symbol formation and symbolic thought. The genetic basis of culture is the greatest achievement of biological evolution, and it is utterly improbable that it can remain static for any length of time.

This poses a problem of incalculable significance—of understanding and eventually of controlling the processes of change which affect the genetic endowment of mankind, on which the biological as well as the cultural prospects inexorably depend. Faced with this problem, a biologist is in an awkward position—he knows too much to ignore it, and not enough to solve it. For one of the paradoxes of this age of science is that man has applied his burgeoning knowledge to almost everything but himself. Does human evolution flow like a river, ever onward despite a meandering course? We cannot be completely sure. But one thing is certain—with the advance of culture, natural selection promotes genetic endowments which are different in some respects from those which selection favored in our pre-human ancestors.

This is commonly illustrated by reference to the progress and accomplishments of the art of healing. Tuberculosis was until recently one of the major scourges of humanity and an inveterate killer of persons of reproductive and prereproductive ages. Modern medicine has all but eliminated tuberculosis in some countries, and bids fair to do so universally. Control of malaria throughout the tropics may prove an even more outstanding achievement. Now,

there is reasonably good evidence that the susceptibility to tuberculosis, and also to malaria, are genetically conditioned. I hasten to add that discovery of genetic conditioning does not refute the existence of an interacting environmental conditioning. This is proven by the very fact that the diseases in question can be eliminated by improved hygiene and sanitation. We can infer, then, that the genotypes which predispose people to tuberculosis and malaria are eliminated by selection less often at present than they used to be. A reasonable further inference is that these genetic constitutions will grow in frequency in human populations.

Natural selection has, no doubt, become relaxed with respect to quite a number of genetic traits which were dangerous or fatal under conditions of a not so remote past. It takes no prophetic gift to predict that this relaxation will continue in the future. But it does not follow that natural selection no longer operates in the human species; nor is there any need to conjure an apocalyptic vision of impending doom, which some writers have fabricated. Let it not be forgotten that natural selection is not a *deus ex machina* but an automatic consequence of the encounters between a living population and its environment. As pointed out above, it makes no sense to talk of a genotype being favorable or unfavorable if the environment is not specified. The environment of the Machine Age is not the same as that of the Stone Age. It can hardly be expected that natural selection will favor the same genetic constitutions perpetually. Moreover, this instability of selection is nothing peculiar to man or to the civilized state; natural selection shuffled the genes of free-living animals and plants differently during the Ice Age and in postglacial times. As the environment changes, selection may become more stringent in some respects and less so in others.

There is, indeed, some evidence that for certain human genes natural selection is more rigorous at present than it was in the past. The clearest example is the gene for porphyria studied in South African populations by Dr. Dean. Its carriers can be identified by a simple chemical test; if they are country folks living under rustic conditions they suffer no major inconvenience; however, certain drugs which are non-toxic to most people, such as some sleeping pills and pain killers, cause grave and even fatal illness in porphyrics. The invention of environments which contain sleeping pills must

certainly be credited to the medical profession, and many of us tender our thanks for this discovery. But the carriers of porphyria are decidedly unfit in these environments.

There are reasons to think that the environments of the Machine Age discriminate against many other genetic constitutions. Take, for example, the suggestive fact that epidemics of paralyzing polio occur chiefly in countries with high standards of sanitation, but not in those with low standards, perhaps because in the latter almost everybody acquires an immunity through subclinical infection. The evidence for genetic control of the susceptibility to polio is far from convincing, but taking it at face value we would have to conclude that the relative fitness of some genotypes is decreased by sanitation. Consider also that shortages of food were the greatest peril to man's life until the dangers of overeating became more menacing to some "chosen" people. Now, one may surmise that some genetic constitutions which are able efficiently to utilize and store up nourishment are also prone to obesity, high cholesterol levels in the blood, and heart disease. Prosperity may put them at a relative disadvantage. Consider finally that living in what is sometimes referred to as "ulcer belt" cities may be hard on many genetic constitutions which thrive on pastoral simplicity.

Natural selection is at work in modern mankind, although it functions in what, in a manner of speaking, are highly unnatural environments. We must, however, be on our guard not to be led astray by this treacherous adjective "natural." In modern genetics, selection refers simply to the fact that in a population composed of a variety of genotypes, some of the latter leave in succeeding generations greater numbers of progeny relative to other genotypes. The heroic, or awesome, image of the surviving "fittest," so dear to social Darwinists and racists, is degraded to the rather unromantic figure of a parent or grandparent of a prolific family. When famliy planning will be governed by an intent to perpetuate certain genotypes and to limit the perpetuation of others, mankind will have reached the era of artificial selection. In our time natural selection is in the saddle. That this selection now favors different genetic endowments than it did in the Cave Man is patent. Even before the advent of the Machine Age, not to speak of the Atomic Age, man was irrevocably committed to live in environments created by his

culture. In this respect, man passed the point of no return many thousands of years before he knew it.

Fossil men had large and strong teeth, but their crowns were much worn at relatively young ages. Cooked foods which we eat are less abrasive, yet all the same, some of us have to resort to wearing false teeth. (Parenthetically, we may note that tooth caries also tormented some prehistoric men.) But we live in environments in which dentists abound, and this augments the fitness of genetic endowments which are liable to yield weak teeth. Surely, it does not follow that for men of the Machine Age it is desirable to have weak teeth; health authorities do their best to improve the teeth in the growing generation. But natural selection has taken other paths in civilized man; the selection for the maintenance of strong teeth has become relaxed in comparison with bygone ages.

The example of teeth and dentists is a fair illustration of a much more general principle. It is a fallacy to think that natural selection necessarily promotes genotypes which are good or desirable in our human estimation. In fact, natural selection cannot be relied upon even to preserve the species from extinction. The evidence of this is plentiful—paleontological museums are full of fossilized remains of creatures most of which died out without issue. Yet their evolution was under control of natural selection; it occurred under unadulterated "natural" conditions. This is only an apparent paradox. Extinction is a result of the opportunism of natural selection—selection may drive a species into a blind alley of specialized adaptation to an environment which does not endure. Man can rely even less upon natural selection. Our ideas of what is desirable and undesirable, superior and inferior, good and bad, are fashioned by the evolution of culture. They are not bestowed upon us by our genes. The myth of limitless perfectibility of man, the cherished heritage of the Age of Enlightenment, is not encompassed by the theory of natural selection.

All this does not mean that biologists should abdicate their responsibility for the direction of human evolution—and I mean biological as well as cultural evolutions, since they are interdependent. I am persuaded that precisely the opposite conclusion is warranted. Since man cannot rely upon biological forces to keep him at peace with his own nature and with his environment, he

can depend only on his wisdom and knowledge, including knowledge of biology and genetics, to help him accomplish this end. Perhaps the frenetic confusion of recent years concerning the genetic hazards of atomic energy will prove useful after all. The peaceful uses of atomic energy are with us to stay, and the debates about their hazards may help to direct the attention of people to the need of more knowledge and understanding of man and of his genetic substratum. For at least two centuries the frontiers of human knowledge were advancing most rapidly in physical science and in related technology. Biology was and still is a poor relative. What of the future? Although the future often bears only a faint resemblance to prophecies, it does look as if we are about to enter a period when biology will take the lead. Man can hardly afford to be in the dark concerning his destiny much longer.

Some two and a half centuries ago, Blaise Pascal wrote these immortal lines: "When I consider the short duration of my life, swallowed up in the eternity before and after, the little space which I fill, and even can see, engulfed in the infinite immensity of spaces of which I am ignorant, and which know me not, I am frightened, and am astonished at being here rather than there; for there is no reason why here rather than there, why now rather than then. . . . The eternal silence of these infinite spaces frightens me." What light can genetics throw on human destiny? It makes us less ignorant of the immensity of the infinite spaces. Their silence becomes less frightening.

Our species, mankind, is a single genetic unit. The atomic bombs which exploded over the cities of Hiroshima and Nagasaki have doubtless induced mutations which will not be confined to the populations of these two cities. They will be added to the genetic loads of the population of Japan and ultimately of the world. When we consider a problem like that of the genetic damage likely to be caused by radiations, nobody can be satisfied if only he has not suffered radiation exposure. The future of my genes depends ultimately on that of everybody else's genes. Genetics has vindicated the great words of John Donne: ". . . any man's death diminishes me, because I am involved in Mankind."

With Western Civilization rapidly acquiring the character of universality, this imposes upon man a great responsibility. For man-

kind will from now on inescapably be the moulder of its own destiny, and perhaps of the destiny of all life in the Universe. In man, the process of evolution has created its own directing center. But direction requires knowledge. I can hardly do better than to conclude this article by quoting Teilhard de Chardin: "Taken in the full modern sense of the word, Science is the twin sister of Humanity. Born together, these two ideas, or two dreams, have grown together, until they attained a quasi-religious value during the last century. They have also known the same dishonors. Which does not prevent them, supporting each other, from always representing the ideals to which our imagination comes every time it tries to materialize on earth its reasons for its faith and its hope."

All Is Vanity

By JAMES LEIGH

Anyface, Anyface, you may find him any place

Rising with the light, I hawkshawed after
Anyface, through all the day to darkrise, when,
By sublimated rays out of my thighs,
I chased him round my skull the lovelong night.

Anyface, Anyface, you may find him any place

Found him, named him, stabbed him, heard his laughter
Echo, Phoenix-like, behind my eyes. Again
I tracked him down, just for the exorcise:
He bowed, and said, "Be sure the noose is tight."

Anyface, Anyface, you may find him any place

While we watched him dangle from a rafter
In my brain, I chose to compromise. Then
I was free, wearing his last disguise,
To take my stitch in time as best I might.

La Divina

By VICTOR CHAPIN

■ In Rome, that city of phenomenona, a year after the war ended, a new phenomenon emerged: the cinema. Every son and daughter of every overpacked, underfed Italian family had now a hope where none had previously existed: to act in the cinema. In every crowded street in Trastevere, in every block of workers' flats beyond the Appian Way, someone knew someone who had gotten a part in a picture. Modest girls from respectable homes defied their mothers and went out in the street in sweaters; and young men, who would if they could have hoped for careers as doctors or lawyers, oiled their hair and wore trousers two sizes too small.

The square outside my hotel, which was near the Piazza di Spagna and the Spanish steps, was always full of youths with a vision in their eyes. They waited all day and half the night to see the directors, producers, and actors who had come from America to make pictures with frozen funds; and when one of them at last emerged, these watchers sucked in their cheeks, pushed out their chests, and rushed forward to beg for glory. Usually, they were thrust aside, and car doors were slammed in their faces. Occasionally, a director or an actor, moved by pity or curiosity, would stand still in the square and stare at them until he could bear their piteousness no longer. Then he would shake his head and retreat, or, if moved or shamed unendurably, offer money that was always refused.

Though I had an unimportant part in a costume film that was being made in the Quirinal, the palace of the former King, I was

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VICTOR CHAPIN's third book, *Company of Players*, was published by Houghton, Mifflin in February and his stories have appeared widely in literary journals. Much of his writing reflects his experience as an actor, writer, and director in movies, television, and on the stage.

considered by these youths to be a person of influence. They flocked round me in the square whenever I appeared, sent me pleading letters or called me on the phone to offer their talents, even, occasionally, their persons; and I never knew how they had learned my name and the number of my room. It was useless to tell them I could do nothing for them, that I was nothing, for they simply did not believe it. If I had tried to explain to them that I had come to Rome at my own expense to work for an extra's wages because I could not get a job in New York, they would not have understood. My prestige with them was invincible because I was part of the world to which they aspired, and they looked at me with wonder, much as if I were enchanted. They were convinced I had an almost magic power that I could share with them if only they could persuade me. It was alternately annoying and heartbreaking.

The star of our picture, Lorraine Divine, who was known throughout the world to millions of fans as Divine Lorraine but in the Profession as Lorraine the Undivine, lived at a better hotel on the Via Veneto. She was beautiful, with enormous eyes, a perfect oval face, an excellent figure, and orange hair. She loved the crowds that waited in the street before her hotel to see *La Divina*, and she was never in so great a hurry that she did not stop, when she came out, to let them look at her. She could not talk to her admirers, and so was unaware of the dreams they told her of and the offers they made her, some of which would have caused a sudden, exciting blush to color her pale cheeks. She adored this adulation, for there was in it an intensity and respect that must have seemed to her, since she could not understand a word they said, almost reverent. She smiled and waved and gave autographs; and when men or women clutched at her, holding fast to her coat, she smiled more radiantly and waited patiently for an aide to pry them loose.

This was the Undivine Lorraine's first experience abroad. Every day in the lobby of her hotel, a battery of reporters recorded her impressions, which I read with interest in the papers each morning, for they were reported verbatim. "I love Rome because it's *old*," she said one day. "And I love old things. . . . Of course, at home, everything is new. We want new things . . . but here, a thing isn't any good unless it's old. The older it is, the more it costs. Isn't that funny?"

One afternoon she entered the hotel escorted by a chauffeur with his arms full of packages. As I was waiting for someone in the lobby near the reporters, I overheard this interview:

"Boys, I've been shopping. Want to see?"

They all wanted to see and gathered round. The chauffeur began unwrapping packages. Lorraine held up a small terra cotta figure. "This is old, *real* old," Lorraine announced happily. "Eighty thousand lire. I don't know how much that is, but it's a lot."

"What is it?" a reporter asked.

"I don't know. They told me the name. A funny name. It's Greek or something." She looked round and saw me standing near. To my surprise, she recognized me. "You," she called. "Come over. Look what I got."

I came nearer. "Lovely," I said. I had seen the figure in a shop on the Via Condotti and had been hoping to save enough money to buy it.

"Do you know what it is?" Lorraine asked.

"It's a Tanagra figure, I think," I answered. "I would guess a Roman copy."

"*Copy*? But they said it was old. I've been cheated."

"No, Miss Divine. It's old. Probably fifteen hundred years old. I meant it was an old Roman copy of an even older Greek original."

"Well, for eighty thousand lire it shouldn't be a copy."

"It's a bargain," I said.

"It is? You like it?"

"I adore it," I said fervently. "As a matter of fact, I had my eye on it."

"You did?" Lorraine was delighted. "And I got it away from you. Isn't that wonderful?" She smiled innocently at me, then at the reporters and turned to another package. "A half million lire," she said, producing a jeweled brooch from Bulgari's. "How much is that?" she asked, turning to me.

"About a thousand dollars . . . a little more."

"Is that all? I thought I was paying a fortune. Isn't that funny?" She smiled again and opened a larger package. She held up a silver ball gown. The reporters gasped.

"That was a million," she said. "I'll wear it to the Academy dinner in March. . . ."

When the interview was over and the chauffeur had re-wrapped her packages, Lorraine moved toward the elevators. Halfway there, she turned back and gestured to me. "You," she said. "Are you mad because I got your statue?"

"No," I said. "I wouldn't have been able to buy it, anyway."

"Here," she said, snatching a package from the chauffeur's pile. "Take it."

"What?" I asked, amazed.

"Take it. It's a present. I don't want it. It's just an old copy."

"But I couldn't take it."

"Sure you could. You're cultured, I can see. You should have it."

"You'll have to let me buy it from you," I said. I knew I couldn't afford it, but I thought perhaps Lorraine, unlike the shopkeeper on the Via Condotti, would let me pay in installments.

"Pay me?" Lorraine's eyes assumed a peculiar expression. I could see she was the victim of a conflict. . . . "Well . . ." she said, "I don't think so . . . but it *was* a lot, wasn't it? . . . How much did I say?"

"Eighty thousand," I answered promptly.

"What's that in money?"

"Two hundred dollars."

"Well . . ." She stood in the middle of the lobby; unaware of the small crowd of clerks, waiters, and guests that was staring at her, she pondered. "Would you maybe be willing to teach me something in exchange?" she asked. "Maybe something about these cultured old things?"

"I would be delighted," I answered. ". . . If there's anything I know."

"Maybe you'd show me some ruins and churches and things. I keep going to them, but none of the men I go with can tell me what anything is."

I did not take my agreement with Lorraine Divine very seriously. I thought she had only offered me an excuse for accepting the Tanagra figure. Though I was pleased to have come into her glamourous orbit, I thought it would be but for a moment. Therefore, I was surprised when Lorraine sent me a message on the set the next day to call for her at her hotel late that afternoon.

I went up to *La Divina*'s suite with some trepidation, for I was overly conscious of my obscurity as an actor and overly anxious for fear I would not be able to interest her. After a number of years in which I had been away from the theatre, I had returned to New York to find myself unknown and unwanted. Having nourished myself through the war with the promise of success when it was over, I experienced with every day that passed a feeling of desperation that was new to me. Being now out of my twenties, I could no longer compensate for today's failure with the thought of tomorrow's success; and try as I would to banish it, the suspicion of some lack in myself to explain my failure persisted in my mind with the dull ache of a rotting tooth before the nerve is exposed.

Waiting in Lorraine's sitting room for her to come out of the bedroom, I wondered what she was like. I knew all the gossip about her temperament, her money complex, her love affairs that never succeeded. She had been a child star and after a few years of obscurity during her adolescence, had emerged a beauty and a bigger star than ever. There were rumours of periodic alcoholism, and it was said she invariably took lovers who turned out to be homosexuals. Observing her on the set, I had been impressed by her capacity for work and her sincere desire for criticism. She did not seem to be an actress so much as a painter intent upon the perfect rendering of her own portrait. The camera was her mirror, and she knew every one of its possible angles. She watched it with suspicion, as if it were alive and treacherous, and when she interrupted a take to complain of the way the camera was set, she seemed to be addressing it rather than the director. She was not the kind of actress I was used to, one accustomed to performing her part whole upon a stage; but she was a craftsman, and I respected her.

When the bedroom door opened and I turned round with a nervous twitch to address myself respectfully to a queen, it was a shock to find myself looking not at Lorraine but at a chubby, plain-faced child of ten.

"How do you do," the child said. "I'm Cathie."

"Hello, Cathie," I answered tentatively.

"I'm to tell you my mother is delayed, and you are to entertain me."

"Oh . . . that's nice." I gazed at the child. Only then did I

remember that Lorraine had a daughter. Since everyone connected with the picture gossiped so much about Lorraine, it was surprising that the child was never mentioned.

"Well . . . so you're in Rome, too," I said, attempting a fatherly tone. "How do you like it?"

"I don't know. I just came. Mother wouldn't let me come until my school was over. I flew . . . all the way from Hollywood."

"Did you like flying?"

"I'm used to it. It's boring, but it's quick."

"Yes," I said wonderingly, ". . . that certainly describes it."

"I took a pill so I wouldn't be sick."

"Did it work?"

"Well, I wasn't sick from the plane, but I was sick from the pill."

"That's too bad," I murmured. ". . . How old are you?" It was a stupid, conventional question, but all I could think to ask just then.

"Nine," Cathie answered.

"You're big for nine."

"I'm really ten, but I say I'm nine."

"Oh . . . why is that?"

"Mummie wants me to be nine, so she won't be so old."

"I see. Well, that's understandable, isn't it?"

"I suppose." Cathie was looking at me as young children do, ruthlessly. "I *want* to be old," she said. "*Very* old."

"How old?"

"I want to be a grandmother."

"I'm afraid you'll have to wait a while for that."

"Are you an actor?" she asked abruptly, with just a hint of ridicule.

"Yes."

"I was afraid of that."

"Don't you like actors?"

"No."

"Why not?"

"They don't know how to play games."

"Oh, but they do."

"Not *fun* games."

"I think they do. . . . *Some* fun games, anyway."

"All right, show me one."

Frantically, I tried to think of a game. But the only one I could remember was a foolish one out of my own childhood, called "The Prince of Paris lost his hat." I asked Cathie if she knew it.

She shook her head. "Let's see it," she said. Her tone was unconvinced.

I taught her the game. She played it seriously, but with an air of appraisal. Finally, after two rounds of it, she sat down on the sofa and threw out her fat legs. "Not bad," she said. "But you can only play it once."

"Yes, you're right," I admitted. "It doesn't stay with you."

"What sort of games do Italian kids play?"

"I'm afraid I don't know."

"Can't you find out?"

"I suppose I could."

"Then do it."

I had my orders. It was obvious there was no chance of ingratiating myself further with Miss Cathie Divine until I could produce the information she wanted.

"Where are we going now?" she asked after a silence.

"Out to look at things."

"What kind of things?"

"Old things. Things out of history. Very beautiful, some of them."

"Old things are dumb."

"No, I don't think that's true. If you'll come along with an open mind, you'll like them."

"Who wants an open mind?"

"Nobody," I said. ". . . But still, you know, it's a good idea."

Cathie stuck out her tongue. "Poopie-poopie-do," she chanted.

"What's that mean?" I asked.

"It means you're full of it," she answered.

"Oh . . ." I suppressed the impulse to ask what it was I was full of because I was afraid I knew what she would say.

Then Lorraine Divine floated in from her bedroom in a swirl of summer silk. "Here we are!" she said brightly. ". . . Have we been having fun?"

"Yes," I said cheerily.

"No," Cathie contradicted.

"No *what*?" Lorraine asked sharply.

"No, we haven't been having fun," Cathie answered.

"That isn't what I mean."

"But it's what *I* mean."

"None of your lip," Lorraine said indignantly. "What do you say?"

"No, Mother," Cathie said wearily.

"That's better. Are you ready to go?"

"Yes."

"Yes what?"

"Yes, Mother."

"That's better."

Cathie got up from the sofa and looked around. "I want my coat," she said.

"You don't need a coat today. It's warm."

"I want my coat."

"Very well, get a jacket then."

"I want my *mink* coat."

"Mink? Today? It's boiling."

"I won't go out without my coat."

"Oh yes you will, young lady. Don't tell me what you'll do and what you won't do."

"Why can't I have my coat?"

"Because it's too hot."

"I want the wops to see my coat."

"*Cathie*!"

"That's what I want." Cathie was not hysterical; she was calm. Implacably calm.

"Maybe she could take the coat and I could carry it for her," I said tentatively.

"Well, maybe that would be all right," Lorraine answered peevishly. "But let's get going."

"Do they have ice cream in Italy?" Cathie asked.

"The best in the world," I said.

"She's on a diet," Lorraine said. "No ice cream."

"You said I could."

"I did not."

"Yes, you did."

"When?"

"When I wouldn't go to sleep when Uncle Dick came. You said if I would go to bed and be quiet, I could have one ice cream a day."

"Oh . . ." Lorraine said. "I guess I did. But it was blackmail."

"What's that?" Cathie asked suspiciously.

"It's a promise that doesn't count."

"Why?"

"Because it doesn't, that's why."

"Why doesn't it?"

"Because I say so."

"Nuts."

Lorraine turned angrily and raised her hand above Cathie's head. "Nuts *what*?" she demanded.

"Nuts, Mother."

"That's better."

We went in procession to the Forum—Lorraine, Cathie, the chauffeur, and I. Since one had to pay to get into the Forum proper, the crowds that had automatically appeared to see Lorraine, waited at the gate. But as we went to each stone and pediment and pillar, we were accompanied by a convoy of guides and Forum attendants. The guides looked at me with anger as I expounded, but Lorraine refused to retain anyone but me to interpret the ruins for her. She seemed to listen to me intently and looked at each historic object with wide-eyed speculation; and whenever Cathie's attention wandered, which it did often, Lorraine slapped her arm and told her to listen or she'd slap her harder when they got home.

But at the end of our tour that day, I knew I had failed to interest Lorraine, either in myself or antiquities. She had wilted under the strain of listening and looking, and in the car on the way back to her hotel, she was fretful.

"Is that all there is to it?" she asked.

"Well," I answered, "it was very different in Roman times. If you like, I'll take you to see the model of it all reconstructed."

"What's that?"

"It's a very large model of what the buildings looked like then."

"I saw what it looked like in the picture," she said. "I think it was Lana Turner . . . or was it Claudette Colbert?"

"Claudette Colbert," I said.

"Yes, that's right. She took a bath in milk."

"Asses' milk," I said.

"Whose?" Cathie asked.

"Asses' milk," I repeated.

"Yes, but who was the ass?"

"Cathie, that's enough," Lorraine said. "You're getting too fresh."

"All I did was ask a question."

Lorraine gave her a sharp look and then turned to me impatiently. "*I* can't get culture," she said fiercely. "I'm too busy and too tired. But *she* can. Will you take her around like this some more?"

"Well, sure," I said, failing to be spontaneously delighted. ". . . I'd be glad to."

"She likes you."

"She does?" I glanced at Cathie. She did not look as if she did.

"Yes, she does."

"How do you know?"

"I can tell."

"Will you give me ice cream?" Cathie demanded.

"One a day," Lorraine said. "You can keep an expense account."

"I'm sorry you won't be coming," I said. It was, I knew, my last chance to impress myself upon Lorraine, who, undivine as she may have been, was attractive and important and could, if she chose, change my life.

"Maybe when the picture's finished," she answered dully. ". . . If they give me time to catch my breath before the next one starts."

"I would like to see you again," I said, daring all.

This caught her attention, if not her interest, and she squirmed round on the seat and looked at me hard. "Cookie," she said, "I'm cutting out actors, just like I cut out sugar and bread. I want a man that's got the time to look at me like he saw me."

"Actors have plenty of time," I said bitterly. "They're out of work most of the year."

"Then they're too busy looking at their own pretty faces." She bit her lovely lip and her perfect eyebrows twitched. ". . . Nothing personal," she added.

"I'm not much of an actor, I'm afraid," I said, hoping that would make a difference.

"I'll see what I can do for you in my next picture." Her tone was mechanical, as if she had made the promise a thousand times to men who had come too close.

"Thanks," I said.

"Don't mention it, I'm sure."

I knew that I had humiliated myself completely before Lorraine, and I knew that she knew it. The only difference was that I was disgusted with myself for having done it and she accepted it as something everybody did. As a result, I felt that I owed it to her as well as to myself to expose Cathie to culture. Therefore, I called for the child in the afternoons whenever I was not wanted at the Quirinal. My part was so small and spasmodic that I was not asked to appear very often, so I found myself with her almost every day. Though I approached the job with profound misgivings, I found that seeing Rome with Cathie was not a bad way to do it. She never contradicted my ideas with ideas of her own, and she went wherever I wanted to go without protest. She did, of course, as children will, ask disconcerting questions, and from time to time she displayed a controlled hostility toward me that I assumed was no greater and no less than the hostility she felt toward all the adults she knew, any one of whom had the power to thwart or confuse her.

Every day we sat down at a cafe across from some interesting site and had an ice cream. One day, about two weeks after our excursions began, we went to a cafe in the square before the Pantheon. It was a busy square full of traffic that burst into it from the dark narrow streets beyond, but in the center there was a small fountain round which the children of the district gathered for their games.

Cathie watched with interest a game that was played with fingers. The children held their hands behind their backs and then on a signal brought them forward. As they did so they called out a

number to guess the total number of fingers they would present together.

"*Quattro . . .*"

"*Sei . . .*"

"*Sette . . .*"

"*Cinque . . .*"

Their voices had a ringing cheerfulness as the game was played over and over, and the square seemed alive with unflagging enjoyment. The ragged, half-starved *ragazzi* generated a kind of solemn gaiety that fascinated me. There was energy in it, and persistence, and composure. I could not analyze its charm or hope to know how children who had nothing could seem to possess so much.

After a while, I realized that Cathie had been unusually quiet. Watching her, I saw that she, too, was fascinated by the children's game. She was aware, as I was, that they had a secret.

"Can I play with them?" she asked suddenly.

"Well, I don't know," I answered doubtfully. "You can't speak Italian. . . ."

"Yes, I can. I'm learning. I know the numbers. . . ." She reeled them off: "*. . . uno, due, tre, quattro, cinque. . . .*"

"But they don't have girls. You see, they're all boys."

"Maybe they'd let me."

"I don't think so. You know what boys are like."

"Yes, I know," she said. ". . . But just the same. . . ."

"What?"

"I could go over and ask."

"But if they said no, then you'd be very upset."

"I'll be more upset if I just sit here and watch."

"Well, sometimes it's better to just sit and watch. At least, I think so."

"That's you," she said crossly. "I'm different."

"I could sit here and watch while you went and tried," I said. ". . . If you really want to try. . . ."

"Yes, I want to."

"Only don't come crying back to me if they give you a hard time."

"How do say please in Italian?"

"*Per favore.*"

"Okay. . . ." She pushed the empty ice cream dish away and jumped down from her chair. "You wait here and watch . . . *per favore*."

I sat and watched while she crossed the square. When she got close to the boys, she circled them, tossing her head indifferently, gazing anywhere but at them. Then, when it was obvious the boys were conscious of her, she moved in. Pretending a sudden interest in the dull little fountain, she ploughed right into their midst. "*Per favore*," she howled suddenly and thrust a hand with three fingers pointing out before her.

The boys laughed and jeered. A geyser of street Italian rose in the square. Some of the words I recognized were crude and even obscene. I got up from my chair and started forward. But Cathie was holding her ground. Again and again she thrust out a hand and cried:: "*Tre, sette, otto, cinque*." Then, desperate, she shouted: "*Per favore*. . . . I'm Cathie Divine . . . my mother is a movie star. . . . *Per favore*."

Just as I was about to run into the square to extract her from the crowd, a small, dirty boy with touseled black hair and trousers that fell too long over his shoes stepped before her and thrust out a hand. "*Dieci*," he roared in a startlingly bass voice.

Other boys circled round; and soon hands were flying in the air, numbers roared round the hallowed Pantheon, and I sat down to my coffee.

It was dusk when Cathie returned to the cafe. "I won," she announced.

"How do you know?" I asked.

"They said so."

"But how do you know they did? You can't speak Italian."

"They said so. I know they did. They shook hands with me."

"Good," I said. "You won. Only I wouldn't tell your mother."

"I won't. But she'd be glad."

"Would she?"

"I mean that I won."

"Yes, she would . . . only she'd object to the boys."

"Why?"

"Well, mothers worry, and little boys can be rough, especially little boys who live in the streets."

"I'm not afraid of them."

"Of course you're not."

"I *like* them."

"Sure you do."

"And they like me. I could tell."

The next time we went out, Cathie was openly rebellious when I proposed a visit to the Vatican Museum. "I want to play fingers," she said.

"Now, you know that wouldn't be fun again," I said. "Games are never as much fun the second time."

"This one is. This one is fun forever."

"Well, I'll play it with you after we see the museum."

The look Cathie gave me was scornful, though not without a certain affection, I thought—that tolerant affection children often display toward adults who have overreached themselves.

"Okay," I said meekly. "We'll look up your gang . . . but after we've seen the museum."

I counted on the museum wearing her out as I knew it would me, but it didn't. She walked miles with me patiently, but when at last we came out into the sunshine, she held me to my promise.

We went again to the cafe by the Pantheon. The boys were there. Cathie ran over to them without waiting for ice cream. They greeted her casually, as if she had already been one of them a long time. Though I was full of apprehension, I could not help but feel that Cathie had the right to seek her own.

When the boys had tired of playing and began to go in twos and threes into the narrow, damp streets in which they lived, Cathie returned. She had a boy with her. I recognized him as the one who had first thrust out a hand to her the day before.

"I'm treating him to ice cream," Cathie announced.

"Okay," I said. ". . . But maybe you shouldn't show favoritism. The other boys might not like it."

"They all know I'm his girl."

"Oh, they do?"

"That makes it all right."

"I see." I kept silent while the children sat down opposite me. I ordered the ice cream and then surveyed the dirty, ragged youth and the scrubbed, fat girl in the plaid jumper that had cost a hundred

dollars in some shop on the Strip. "How do you know you're his girl?" I asked. "Are you sure *he* knows it?"

"Sure I'm sure."

"Can you understand Italian now?"

"Sort of."

"Listen," I added, more from duty than conviction, "these boys are different from you. They're poor. They grow up faster. I want you to be careful."

"Careful of what?"

Her innocence silenced me. I could not say what it was I feared could happen to her, but the fascination of the *ragazzi* was tinged in my mind with a fear of their invincible self-assurance. They knew the world as even I did not. This much I had learned from observation in all the streets of the city.

"What's your name?" I asked the boy. ". . . *Comme si chiamma*?"

"Massimo," he answered.

"Goody," Cathie cried excitedly, "you can speak Italian. Tell him I love him."

"I'll do no such thing."

"Then tell me how to tell him."

"I will not."

"Please. . . ."

"Nothing doing. You're too young to have a boy friend. Your mother would kill me."

"I'm too young to have a boy friend for keeps, but why can't I have a boy friend just to play with?"

"No reason," I answered, ". . . if you can behave yourself."

The next day, I was due on the set. When I arrived, the director, who had never spoken to me before, came up and leered at me. "Lorraine's looking for you," he said. "What's it about?"

I said I didn't know.

"Making time?" he asked.

"Hardly."

"I wouldn't have thought you were her type."

"I'm not."

"Then what's up?"

"I'm her baby sitter," I said, ". . . and that's all we will ever be to each other. . . ."

Lorraine appeared, dressed and made up for the scene. Seeing me, she changed her course and walked over to where I was standing.

"I want to talk to you," she said.

"Yes, Miss Divine," I said fearfully.

"Who is Massimo?"

"So that's it. . . ."

"Yes, that's it. Who is he?"

"A boy. An Italian boy."

"What's she been doing with him?"

"Playing fingers."

"*What*?"

"It's a game."

"Where has this been going on?"

"In the square by the Pantheon, where we go for ice cream."

"Where you *used* to go, you mean. You've *had* it."

Suddenly indignant, I found a courage I would not have thought I possessed. "Just a minute, Miss Divine," I said. ". . . There's no harm in this Massimo. It's been good for Cathie."

"In a pig's eye it has. She had a fever last night and she screamed at me like a child of the streets. What's more, she screamed at me in *Italian*."

"What was the matter?"

"She wouldn't go to bed."

"What was upsetting her?"

"Nothing. I was merely entertaining a gentleman and she refused to leave the room."

"What did she say?"

"She said she didn't love me, she loved this Massimo. She said she hated me and loved the wop. She said it a dozen times."

"Massimo is probably no more than eight," I said.

"I don't care if he's eighty-eight and descended from Jesus Christ. I won't have it."

"Very well, Miss Divine," I said. "I'm sorry. I tried to be nice to Cathie."

"And we're very much obliged, I'm sure," Lorraine answered

nastily. ". . . But in future, if you don't mind, we'll take our culture elsewhere. . . ."

That, I thought, was the last I would ever see of Lorraine Divine or Cathie or a job in pictures. But that night, just as I was packing up my Tanagra figure to send it back to Lorraine, the phone rang in my room.

It was Lorraine. "Please come . . .," she sobbed on the wire. "Cathie's run away. . . ."

I found Lorraine raging and sobbing. She was surrounded by studio officials and hotel managers wringing their hands. The room was full of cigar smoke. When I arrived, everyone shouted at me and shoved me toward the door. Outside, I could see policemen coming down the hall.

"Find her!" Lorraine cried. "You know where she is!"

"I don't," I said. "When did she go?"

"Tonight."

"Why?"

"Don't ask questions, you fool. Find her."

"Now wait a minute, Miss Divine," I said angrily. "I'm not under arrest. . . . Not yet, anyway. . . ."

"I'm sorry . . ." Lorraine crossed the room and put her arms around me. . . . "Please," she whispered. ". . . Please find her."

"All right," I agreed. "But where do you think she went?"

"To that wop kid . . . Massimo."

"What makes you think so?"

"Because she left a note . . . here. . . ." She looked around wildly and, after some confusion, was handed the note by a weeping woman whom I took to be a governess, though I had never seen her before.

"Why did she go?" I asked.

"Because I hired this woman for her governess. A good reliable Englishwoman. Ten dollars a day. But Cathie wouldn't have it. She said I'd hired a policeman to keep her from seeing you. . . ."

"She said *me*?" I asked.

"But she meant that kid."

"Oh. . . ." I looked down at the note.

DEAR MUMMIE
I HATE YOU. I'M RUNNING AWAY. I WILL MARRY MASYMO.
LOVE
CATHIE

"I don't know where the kid lives," I said. "Cathie must have tried to find the square."

"Take the police there and find the kid."

"No," I said.

"What?" Lorraine cried.

"*What*?" A dozen voices echoed.

"I won't go with the police," I said calmly, though I was frightened by my own temerity. ". . . I'll go alone, or not at all. . ."

"But why? What do you want?" Lorraine was cold and suspicious now.

"I don't want anything. I just want to bring Cathie back without frightening her."

"Why should she be frightened? I'm her mother."

"I don't know why, and I don't care. But I want to go alone."

"Then hurry up, for God's sake," Lorraine shouted. "While you're standing there she's probably being raped."

"Nonsense," I said.

"Yeah, you think so? How young do you think *I* was when I was raped?"

"All right," I muttered, blushing. ". . . But let me go alone. Don't have me followed."

"I tried to make her a lady," Lorraine sobbed suddenly, clutching at my coat. "All I wanted was for her to be a lady. Now she's going to be a whore . . . like me. . . ."

"Don't be silly, Lorraine," I said. "Cathie is okay. You've messed her up, but you can't help that. Your heart was in the right place. . . ."

"Oh yeah?" Lorraine lifted her head and fastened large angry eyes upon me. ". . . And who the hell do you think you are?"

The police followed me anyway, but I took a taxi in the wrong direction and managed to lose them. Then I told the taxi driver to go a long way round to the Pantheon.

The square was almost empty; but though it was nearly midnight, there were a few boys sitting on the fountain wall. I looked them over carefully, but they were all older than Massimo.

"Massimo?" I asked. "*Conoscete* Massimo?"

"Massimo?"

"*Dove la casa di* Massimo?"

"Massimo? *Molti Massimi in questo vicino.*"

"*Piccolo* Massimo," I said desperately. I mussed up my hair and then, with inspiration, tugged at my trouser legs until the cuffs hung down over my shoes. Then the boys laughed and clapped their hands.

"Massimo!" they cried. "Massimo Lorusso. Massimo *il piccolo* Charlie Chaplin."

"Yes, yes," I cried. "*Dove la sua casa?*"

"*Perche?*"

"*Perche? E molto importante.*"

"*Polizia?*"

"*Polizia? Mai . . . mai . . . sono amico. . . .*"

"*Amico?*"

They surveyed me for what seemed a long time. Then, after a whispered conference, one of the boys jumped down from the fountain and motioned to me to follow him.

We walked through a labyrinth of sweating streets, through refuse and streams of urine, past dogs and wine shops and homeless lovers, into the heart of life. Finally, we reached a dark doorway. My guide pointed to it. "*Terzo piano,*" he said.

"*Grazie Molto,*" I said.

"*Niente. Ciao.*"

On the stairs the smells of garlic, cats, and urine were more intense. At the door of Massimo's apartment, I stopped to listen. There were voices beyond, and laughter. I hesitated to knock, for I would appear an intruder and a fool if Cathie was not there. But then, even as I wondered what to do, I heard her voice.

Massimo's father opened the door: a young man, but broken. His wife was behind him: an aging beauty at twenty-five. There were many more children beside Massimo. Seven or eight, I thought, boys and girls, all madonnas or cherubs. The flat was damp and bare, but clean.

Cathie stood rigid beside Massimo. "What do you want?" she demanded harshly.

"Didn't you expect me?" I asked.

"I thought I could trust you."

"But I *had* to tell where you were," I said. "Your mother knew, anyway."

"I won't go back."

"You have to, honey," I said.

Smiling, laughing, bubbling over with excitement, the family gathered round me. Questions spilled over me like rain.

"Yes," I answered as best I could. ". . . She is the daughter of *La Divina*. . . ."

They were gasping with wonder, raising their hands in exaltation. *La Divina . . . La Divina . . . La figlia della Divina*. . . .

"Come, Cathie," I said. "Say goodbye and thank you."

"No, no . . . I won't go. . . ."

"Please . . . your mother is so unhappy . . . you've been very cruel to her. . . ."

"I won't go. You can't make me."

"But you have to, darling," I said ruthlessly. "These people are poor. They have scarcely enough to eat, themselves. Do you want them to starve because they have to feed you, too?"

Then Cathie sobbed and threw herself down on the floor, and I knew I had cruelly won. She allowed me to take her hand and lift her to her feet. She hung her head and said nothing as I thanked the family and said goodbye. But as we went out into the cold, dark hall and started down the stinking stairs, she began to scream. "Massimo . . . Massimo . . .," she cried. "Massimo . . . I love you."

After that, Lorraine Divine would not permit me to see Cathie, and she never again spoke to me on the set. But I found that whether she would like it or not, I was united with *La Divina* in a legend.

One day soon afterwards, as I left my hotel and confronted the legions of the hopeful in the square, a young man stepped from the ranks and, smiling confidently, bowed before me. . . . "*Sono il cugino di Massimo*," he said.

And the next day there was another who announced himself the same, and another the day after that, until there were so many that it seemed to me the cousins of Massimo could people the earth.

Say the Children

By LEONARD NATHAN

"A door is to close or open," say the children.
"The lock of it clicks to keep inside from night
"Or to open once to let a bird dive in,
"But usually friends to come in out of light.

"A window is to look out of," say the children.
"Sick to bed or in a rain down day,
"Or into dark, but not to let it in,
"Or is an eye watched down on our wrong play."

"Walls and roof keep children in," say the children.
"And out what hurts to live in wind or cold,
"Kept out there to be unwanted or within
"To be nursed. Rooms grow littler very old."

Contract

By LEONARD NATHAN

In this marriage contract of unlikes
Who swore to honor, love, and to obey
There is the clause in heat-revealed type
That tells each party how to make it pay.

Withholding taxes, wrath rubs in the veins,
Pleasure itself can melt a poisoned sweet
In mouths depreciating tongue in cheek,
For wit can turn defeat upon defeat.

The clause is binding, even mixed with pity,
Though when one drops or flies, the profit fails.
And if some few abide until the end,
The law is blind and has a set of scales.

LEONARD NATHAN's first volume of verse, *Western Reaches*, was published last spring and he was the 1958 winner of the John D. Phelan Award for narrative poetry. His poems have appeared in such magazines as *The New Yorker* and *The Nation* as well as in the poetry journals and literary quarterlies.

The Second Birth of Mrs. Gibbs

By THOMAS C. TURNER

■ The staff and guests of the Hotel Olympia had sensed that John Haskell and his beautiful wife, now seen on the patio on their way to the beach, were honeymooning. Mrs. Haskell, brilliantly blond, seemed the ideal bride, no more than twenty, whereas her husband looked to be about ten years older. He was handsome and light-haired and looked like a successful young executive.

Marilyn Haskell in a bathing suit walked with the relaxed gait of a healthy young woman, but in the bottom of her beach bag were six No-Doz pills, and she was saying to herself: I must not go to sleep. She had felt apprehensive about going to the beach because she knew the sun would make her drowsy.

They dropped their towels on beach chairs, and she said: "Let's swim." She tucked her hair under her bathing cap as she waded into the water. Her husband followed slowly. The water was lukewarm, and instead of stimulating her, it made her even sleepier. She went out until it was waist deep, then floated on her back, afraid to let her heavy lids close, her smooth slim legs resting on thick salty water as on green jelly. When he reached her, she let her feet down and faced him with a guilty smile. He looked at her for a long time. "What is it, Marilyn?"

She kept smiling, but her heart raced. "What's what?" She was pushing backward away from him toward the deep water.

"This run-around," he said, keeping up with her. "That business in the hotel last night."

"John, I haven't denied you anything. I don't understand."

THOMAS C. TURNER has had stories in *Harpers* and several literary quarterlies and one of them is third prize winner in this year's O. Henry collection. A graduate of Princeton, he now lives in Alabama and is working on a novel.

"I mean this separate-room business."

"I've told you."

"You told me something, that you were used to sleeping alone, and that would explain separate beds, but it doesn't explain why you want to sleep in a separate room."

"John, it's a little quirk of mine. It's silly, and so am I, a little. I warned you. Just indulge me in this one thing."

He kept looking at her, his face frowning and unhappy. "No."

She lay in the water, not trying to think of a way of telling him the truth, for the truth was the one thing he couldn't forgive, but of some story that would satisfy him. She thought of beginning gradually. "I have been married before, John," she said to herself. "My real name was not Marilyn Case. I was once somebody else."

She could perhaps have gotten away with separate rooms except that this was becoming linked in his mind with something extremely damaging. Temperamentally he was much more jealous than most men, and the fact that he had won his bride from formidable competition and that her beauty attracted attention in public made him worse.

Her momentary loss of control in the dining room that night touched the nerve again. They were finishing dinner when a very old man passed the door. Her heart stopped, then pounded violently, for she thought that from his height and extreme age it was Dr. Narses. No, it couldn't be, it's just another tall old man. She had gotten too quick a glimpse of him to be sure. She turned at once and looked at John, and she realized that she had gasped aloud. "What's wrong?" he said. He looked from her to the door which the old man had passed. "What did you see that frightened you?"

"I don't know. I just felt faint for a second."

"What is it?" His intelligent eyes seemed to plead with her: I will understand if you will just tell me. That's a trap, she thought, although he really thinks he would understand and forgive. "Who was it?" he said. "You saw someone. Who was it?" When she evaded him this time, his face hardened in lines of anger and despair. "Let's go to the room."

The telephone was ringing when they reached the bedroom, and she answered it. The line was open, for she could hear breathing. "Hello," she said. "Hello." John was staring at her. The line clicked

and went dead. Slowly she lowered the instrument. "It must have been a wrong number."

He snatched the telephone from her hand. "Who is this?" he shouted. He replaced the instrument. "Who was it?"

She backed away from him. "I don't know."

He grasped her shoulders. "*Who was it?*"

He released her suddenly and sat down. "I'm sorry," he said.

She sat down on the bed beside him and in her mind went over an explanation, but even as she framed it, she knew she could not tell him. Two years ago, she thought, a middle-aged woman named Mrs. Gibbs was sitting in her suite in the Hotel Crillon in Paris. On the day before her forty-sixth birthday, Mrs. Gibbs received a letter from a stranger. She read it carelessly and automatically balled it up and threw it in a trash basket. She recovered it, smoothed it out, and read it again.

> My dear Mrs. Gibbs,
>
> You have a great deal of money, but you can buy your heart's desire only from me.
>
> Meet me at four this afternoon at the Cafe de Flore. Sit at a table outside, and I will join you.
>
> Your obedient servant,
> Dr. Anton Narses

Mrs. Gibbs was a rich widow, and that status had attracted a variety of swindlers. Perhaps Dr. Narses, unlike the others, penetrated her defenses by his boldness and his very failure to explain himself.

Dr. Anton Narses. The letter was typed, and the big signature evidently written by a trembling hand. She thought she detected a whiff of cologne about the letter paper.

Mrs. Gibbs limped to the mirror and looked at herself. Her heart's desire? That was obvious. The face that looked out at her was much older than her forty-six years should have made it. It looked like a vase which had been broken and glued back together, and between its thin scars the patches of discolored skin were as tight as the glaze of pottery. She had barely survived an airplane crash six years ago, in which her husband had died, and over a period of years she had been reassembled by experts. They had done their best to rebuild her crushed face. They had moved pieces of bone and grafted skin. But still she limped, and she could not move

the third and fourth fingers of her right hand. Recently twinges of arthritis had started in her damaged bones.

"I want my looks back," she said to the mirror. The mutilated nerves and muscles of her face made a bitter uneven smile. No, she had never been good-looking. An ugly duckling, a poor little rich girl with a domineering father, she had grown up to be a very rich, very homely swan. Her youth had passed before she knew what to do with it, she had married a dull negative man, she had been unable to bear children, and now she was alone, with an enormous fortune and a heart like a stone.

No, Dr. Narses, she thought, I am ugly and prematurely old, but I will not let you make a fool of me. You didn't even make it convenient for me to meet you. She read the letter again, then painfully tore it to bits.

But at four o'clock her taxi stopped at St. Germain des Pres, and she limped to a sidewalk table of the Cafe de Flore. It was early October, too sultry to be comfortable, with black and swollen clouds overhead. She sat down and ordered coffee.

"Mrs. Gibbs?" The man who greeted her was very tall and bent, his bony face shadowy with sunken eyes and cheeks. He was extremely old, perhaps ninety. His dark clothes were neither frayed nor faded but looked indefineably ancient. He bowed and sat down opposite her, moving his chair at an angle to watch the sidewalk and street.

She noticed at once that his hands were gloved, and she wondered why he wore gloves on such a warm day. The gloves were flesh-colored and tight, and she hoped he would not take them off. Since childhood she had had the habit of regarding old men as benign or harmless and usually both, yet even this preconception did not transfigure Dr. Narses, and the revulsion he excited in her was not merely physical. "I already know a lot about you," he said. The voice which came from his pinched mouth was surprisingly strong, even resonant. His English was good, and his accent sounded vaguely Balkan. He probably spoke a half-dozen languages fluently. "I knew enough about you to know that you would come," he added.

He had a smell of rosewater about his clothes, but when he spoke, his breath smelled like a dirt cellar.

"You knew I'd come?" she said lightly, her face averted. "*I* didn't. Now suppose you tell me what you have to sell."

He smiled and nodded. His large head seemed to waver, too heavy for his thin neck. "I am a scientist. I can make you young and beautiful." As he spoke, his gaze fixed eagerly on a young woman passing on the sidewalk. He licked his lips and looked back at Mrs. Gibbs. "Do you want to hear the theory behind it? I have discovered the soul. You flinch at the word. I have thrown away all the id, ego, superego nonsense of that charlatan Freud. Yes, I knew him years ago and Krafft-Ebing too. I am in that big book of Krafft-Ebing. But the word soul—it is only a word to describe that pattern which makes you different from anyone else. The soul rarely has its own way and never to its fill. The world has been too much with it, put too many interferences in its way. Not merely inhibitions. One never sees a person who is completely in-te-gwrated."

"Then you're a psychoanalyst?" Already she was looking at the street for a taxi. "I've been through all that."

He laughed hoarsely at the humor of the idea. "No, I am a real scientist. I only talk in metaphor. And to use another from your incomparable English poetry—spiritually I am Anglo-Saxon like you—'The soul is form, and doth the body make.' I have a machine which can restore the soul the world has taken from you, and the flesh will respond. I see you have already refused. Not yet, Mrs. Gibbs, let me show you first."

"How much will it cost?"

"Nothing now. Later it will cost you a great deal of money."

She smiled wryly. "I hadn't expected anything else."

"A familiar experience, is it, Mrs. Gibbs, for people to want your money? But this time you will be glad to pay." He gestured with his slick gloved hands. "Come let me show you."

She sighed. "All right."

They took a taxi which at Dr. Narses' direction went to a grey stone building a few blocks northeast. Dr. Narses unlocked the heavy outside door and led her up a dark stairway. "It is a hard climb to my apartment," he said, gasping hoarsely. "But only to the second floor." The door off the landing opened on a long musty room with heavily draped windows and walls of faded burgundy brocade. The furniture was dark with age. Altogether it was a most

depressing room and exactly what Mrs. Gibbs had expected. What now? she thought. Am I to be swindled or kidnapped?

He led her to a small room with padded walls and floor. A machine stood against the far wall centered around a metal opening from which a net of wire tentacles hung. She looked at the machinery in alarm, and the antiseptic smell brought back the pain of the hospital. "If that machine can restore youth, why haven't you used it on yourself?" she said.

"A very good question. The reason is that this treatment produces convulsions in the subject. The strain would be too great on an old man. But you are so much younger—"

"If it's a faith cure, I may as well tell you I don't believe a word of it."

"So long as you do what I say, that won't make the slightest difference." He looked at her with ancient watery eyes. "Do you want to hear how it works?" She nodded. "The soul is like a message in code, a verse of poetry perhaps, which has been passed through a very large number of transmitters—from the lips of one instant to the ears of another. Thus it becomes disorganized. I have found a key to that pattern. Neurologists have known for a long time that the brain has rhythmic waves of electrical impulses, and that something like an electronic scanning process takes place in the visual cortex of the brain. But there is a much more fundamental kind of scanning, a more profound and more general process of adaptation and imitation which we see throughout living nature. I have discovered a very faint rhythm in the brain which represents this scanning—I call it the zeta rhythm—which is most closely associated with what is really you."

He motioned toward the machine. "I connect these electrodes to your head, and you look at that bank of red lights in the ceiling. The electrodes pick up that very faint zeta rhythm, which is reproduced in those lights. The lights in turn excite the brain. In its desperate effort to adapt, the accretion of interference is cast off by the brain, and the brain imitates its own pattern and reverses the entropic process of disorganization and aging."

She stared at the machine. Even on it was some of the ancient shabbiness of Dr. Narses. Metal parts of the machine were rusting, and the upholstery of the couch looked soiled.

"I will not explain the machine in detail. You wouldn't understand. Those electrodes are connected to cathode ray tubes, which pour the impulses from your brain into a wave analyzer. That in turn acts as a prism, so to speak, which eliminates all but the red light."

"But how could this change my body?"

"How does the fertilized ovum grow into a much larger predictable organism which it doesn't in the least resemble? How do simpler organisms—which are truly integrated—replace parts which are amputated? The soul is a message, and it has been shown that psychotics can be helped if that message, and the perseveration which carries it forward, can be interrupted long enough by shock for the individual patterns to regain their pristine dominance. Liberate them so to speak. Too long an interruption brings death—the greatest liberation of all, as the preachers would say. Apparently the soul in its infinite self-love desires principally itself, so you can rest assured of the outcome if you, in your heart of hearts, really want to become young and desirable.

"Yes, yes," she said impatiently. But was she sure? Was she perhaps at heart even older than her years? She sat on the couch and looked at the wall. She had often wished for death after her accident, especially during those two months when she had not slept at all. She had even planned to take an overdose of sleeping tablets. "Perhaps at heart I am old," she said. She was frightened now, and her voice trembled. "Perhaps at heart I am on the point of death."

"No," said Dr. Narses with a softness of manner which could have been mistaken for kindness. "If you were really old at heart, you would never have come here."

"Have you ever used that machine before?"

"Only in a study of epilepsy years ago. It has developed greatly since then."

"Let's get it over with," she said.

"We must wait until morning when you are rested."

"No! Now."

He pushed the door shut. "Lie down on the couch. I must attach these electrodes." She lay on her back, her skin flinching at the touch of his gloved hands, and he clamped the net of electrodes to her head. "I see you wear some false hair to conceal a silver plate in

your skull. I would never have known." He pulled the straps tight on arms and legs, chest and head.

She closed her eyes. She could hear him moving softly over the padded floor. "How does this affect the memory?" she said.

"It will definitely do something to your memory traces."

"I become what I really am," she murmured. "Then will I be different?"

"I assure you, you will be very different."

I will lose all I have learned, she thought fearfully. After that, I won't be I, and what is it to me if what comes then happens to someone else? I will forget myself. I will be poor. She jerked as the machine buzzed.

"It is just warming up," he said. "The power is not on you now."

She opened her eyes and looked into the red inside of his nostrils. He leaned close and his cellar breath almost suffocated her. "Open your mouth," he said. "I am going to put something in your mouth to keep you from biting or swallowing your tongue."

"Not yet!" she said frantically. "Let me rest first—"

He did not seem to hear, but wedged her lips apart with his fingers, and she gagged on something foreign and uncomfortable. Nausea pushed at her throat. She squirmed and protested with wide rolling eyes. "It is better this way," he said. He talked to himself in an unfamiliar language and rubbed the top of his head with his gloved hand. His skull looked so thin she felt she could push her thumb into it.

The bank of lights came on like a great red compound eye. A pattern drifted across. The eye seemed to dissolve into a score of eyes peeping at her.

Who's there there there, she tried to say, but the words scattered in a flight of many-colored birds. Her body buckled and twisted under the straps like a tree in a hurricane. She heard a silent scream coming in. Dr. Narses looked on, his face rippling and aquarium eyes swimming.

Lightning struck, and she felt herself gagging on a scream. I can't stand this. Cold waves of pain swept through her body, cracking every nerve like the end of a whip.

She was coming up now, the lights were out, and she thought, shuddering, I have broken all those bones again.

As she moved slowly from the depths, she heard Dr. Narses chuckling: "Did I forget to tell you it would be painful? Forgive me."

"Why didn't you give me an anaesthetic?" she whispered.

"You have to watch those lights. Also, the zeta rhythm during sleep or a general anaesthetic becomes so faint it is impossible to detect with my instruments."

She lay aching and exhausted, staring away from him. "You are a fraud," she said numbly. "I remember everything."

"I didn't mean you would forget. You will soon see that your memories seem different to you, loosened to form into new clusters."

She still ached and trembled so that she could not trust herself to stand. "Call a hospital," she said. "I'm ill. I can't stand another treatment."

Dr. Narses shook his head. "No, I can't let you leave now. I want to make sure you will come back."

"Bring me a mirror."

"Not yet." He went to the door. "Sleep. Tomorrow, you will have your second treatment."

She was relieved to hear the door shut behind him. "I can't stand him," she thought. Her skull felt like a bowl of ice. She didn't care so much now what happened. She felt already that she had been here all her life, that she had become involved with this man and would never be rid of him again.

She awoke in the morning with the smell of dirt in her face and looked up into the cold lizard eyes of Dr. Narses. Already he was clamping the crown of electrodes on her face and tightening the straps on her arms and legs. "Open your mouth," he said.

"That thing hurts the underside of my tongue," she said.

Gloved fingers pinched her nostrils shut, and her mouth opened in a gasp. The thing crowded into her mouth, she gagged, and once more the machine behind her came to life.

The waves swept over her again, with sickening pain. The forms of her hallucinations—abstract and fleeting—almost meant something to her but changed before she could grasp them.

Once more she pushed for the surface and lay shuddering and gasping for air. The voice of Dr. Narses wound from the darkness

beyond her closed eyelids. "We must arrange for payments now, Mrs. Gibbs. Who handles your affairs here?"

"I won't pay you until this is finished."

"It has to be now," he said. He held up a small metal pin. "Do you recognize this?"

"No."

"Your knee gave it up just now," he said. "Evidently a surgeon put it there to hold your knee joint together."

She sat up too quickly, her head swimming, and grasped her knee.

"You are changing even more quickly than I had expected," said Dr. Narses. "I think when we go to see your lawyer you had better wear a veil and a heavy coat. Come look at yourself."

She got up and walked unsteadily out the door. Across the ancient room in the direction he indicated she saw a large oil painting. Puzzled, she walked toward it. She could see from the middle of the room that it was a Fragonard—a delicate pastoral scene, of a rosy-cheeked shepherd boy courting a coy milk-maid. Then closer she saw what was going on. The painting was obscene.

She turned angrily on Dr. Narses. His wide thin mouth opened far back into his cheek like a lizard's in a smile. He turned a switch, and a dim chandelier came on overhead. "I didn't mean for you to look at the painting—unless you wanted to. I meant the mirror beside it."

The mirror was framed in gilded plaster like the painting. The plaster was flaking and cracking, and the silver was coming off as though clawed off from behind. It had probably reflected scenes not very different from the one in oil as it now reflected the dusty twilight of garish faded elegance. "Look at yourself in the mirror."

"No."

"You must." His voice cracked. "Because you are about to pay me."

"Not until it's over."

He trembled in withered rage. "Don't you see that you won't pass for Mrs. Gibbs anymore? Your face, your voice, your handwriting—all will be changed."

"How much are you asking?"

"All you have."

"You're mad!"

"Don't you see it's the only way? I will return half of it to you when the treatment is over. But by then you will be so completely altered you won't be able to touch your money."

She looked at her hands. Her dead fingers had come back to life, the swellings were gone from the knuckles, and she opened and closed her hands without pain. These hands were hers all right, but lighter in color, and the scars were so faint she could hardly find them. She looked in wonder. Then she realized that she had walked without pain. She pulled her skirt over her knee and looked at her crushed leg. It had completely healed. She mashed the firm pink flesh of her thigh. Dr. Narses looked too, and she pulled her skirt down quickly.

"I will lose a lot of my property through taxes in these transactions," she said. "But there is no other way. My lawyer is J. N. C. Remington."

That afternoon she savored through her veil the astonishment on Mr. Remington's thin, well-bred face as she told him what she intended to do. "Mrs. Gibbs, you're going to give this man everything?" He peered at her veiled face and turned a disapproving glance on Dr. Narses.

"Everything," she said. "And if you doubt that I'm in my right mind, look at me. Don't I look well?"

"Extremely well, Mrs. Gibbs," said Mr. Remington. "You look and sound better than you have in years. But everything!" He pronounced the word dismally and shook his head.

"Draw it up and I'll sign it." She looked at her watch. "But please hurry."

"I want a million of it in cash," said Dr. Narses. "A certified check on the Morgan Bank will be satisfactory."

Mrs. Gibbs was careful to limp as she left the office, and passing through the anteroom, she looked at her reflection in the mirror fearfully as she had after the airplane crash. She was relieved. The mirror showed only a woman in a heavy coat, hat, and veil. "It's well we didn't wait any longer," whispered Dr. Narses. "He looked at you suspiciously even now."

The third treatment brought out the silver plate from her skull, and she was still trembling from the long final agony when Dr.

Narses said: "You must come now and see yourself. Since you didn't like my old mirror, I have ordered a new one for you." He surveyed her with relish. "Come along."

"I'm very hungry," she said. "I want something to eat."

"I will have our dinner sent here. Your appetite has increased. You have had very interesting changes in your metabolism." He patted her playfully. "You are stalling! You're afraid of the mirror."

The floor-length mirror, just uncrated, was new and shiny. It looked as though it had never reflected anything at all. Mrs. Gibbs advanced slowly toward it. "What have you done to my hair?" she cried at him. "You've bleached my hair!"

"Look again."

She stepped closer to the mirror. This new hair was fine and bright as gold. The face was a young girl's, oval, blue-eyed, with the most perfect features she had ever seen. Yet it was not an insipid face. The features were sharply cut, and the eyes looked wise. She opened her mouth, and looked at her beautiful even teeth. She had grown taller and straighter, her waist smaller, her bosom high and full. She raised her fingers to the clear bright skin of her face and throat. "That can't be me," she said with a gasp.

"Yes, it's you."

"My clothes don't fit."

"And I will get you new clothes, and everything else you want."

In the mirror she saw him walk close behind her and pull off his gloves. She looked down in horror at the hands which wrapped around her waist. They were corpse-white and moist. Simultaneously she smelled rosewater and dirt, and she lunged away. "What are you doing?" she said in alarm.

"You need me now, my dear. You are as poor as a church mouse. You have no money and no identity, except what I choose to give you."

"You promised—"

"I will keep my promise, and I expect something in return. We can enjoy the money together." He reached for her again, his wide mouth splitting deep into his cheeks.

"You crazy old man! I can't even stand the sight of you. Do you think I'd let you touch me!" She fended him off and darted for the door. "If you're going back on your part of the bargain, I won't

keep my part either. I'm going to Mr. Remington and get this thing stopped."

Dr. Narses laughed a high-pitched cackle. "You'll be back. I did not spend my life creating a woman like you to lose her."

She grabbed her pocketbook and ran downstairs two steps at the time. She walked quickly along the narrow sidewalk and paused at the corner to get out some change. Dr. Narses had taken every franc. Never mind, she would walk. A young Frenchman who needed a haircut spoke to her, and she realized that he was trying to pick her up. She moved on quickly, her head high. She was too angry with Dr. Narses to know how to feel about this street-corner admirer. It had never happened to her before.

She was flushed and out-of-breath when she reached Mr. Remington's office. She walked briskly to his secretary. "Tell Mr. Remington I must see him at once. I'm Mrs. Gibbs."

When Mr. Remington appeared in his English-cut suit, he stopped abruptly, and his expression changed from prepared deference to surprise. "Yes, mademoiselle. What did you say your name was?"

"I'm Mrs. Marilyn Huntington Gibbs. I know that will strike you as peculiar, but if you'll listen to my story—"

"Come into my office please." He closed the door behind her. "Now who are you?" he said sharply. "You're not Mrs. Gibbs. Mrs. Gibbs has been a client of mine for years. Someone has misinformed you, young woman. Mrs. Gibbs is over twice your age, and she doesn't look in the least like you. You can't impersonate her." He looked her up and down. "How old are you? Nineteen?"

She hesitated. "Eighteen," she said.

"You are very young to get into this kind of trouble," he said sternly. "You can be sent to jail for this. If money is what you're after, my advice is to try the stage or films."

Mrs. Gibbs walked slowly to the door. She had known she looked different, but somehow she had expected her identity to come through and be recognized.

She saw herself in the mirror. She *was* beautiful and radiant. Her memory had not really been impaired, but she had no feeling mixed in her memories, no nostalgia for her old life. She could by laborious efforts establish her identity with members of her family—

and probably recover some of her money from Dr. Narses. But this change sounded too much like black magic, too abnormal. She would brand herself as a freak for life. Why admit to forty-six years, besides, when she could pass for eighteen? She had enjoyed money. Why not youth and beauty now?

Her immediate problem was a place to spend the night. That afternoon at a sidewalk cafe it had not taken long for her under the name of Marilyn Case to fall in with an American girl named Claire Andrews who worked at the U.S. Embassy. Though her story about why she should be penniless and alone in Paris had left Claire suspicious, the latter let Marilyn sleep on the sofa in the living room of her apartment.

That night Marilyn lay down and wrapped herself in a blanket, comfortably tired and eager to sleep for she looked forward to morning. She drifted off, pleasantly aware of rustling leaves and traffic noises on the boulevard.

The next thing she knew, she was limping, and pain rebounded in her head. Under a swollen sky she moved to a table of the Cafe de Flore, and a tall bent man joined her. She saw every detail—even the veins and bones under his thin gloves—and smelled the rosewater and dirt.

In a labyrinth she met her father, she saw the ground swing up under the tilting wing of the airliner. She often saw Dr. Narses. He wore various masks, but she knew him. As she awoke, she saw him standing on the balcony.

She sat up, gasping in fright. The room cleared at once. It was morning, a yellow glow bathed the room, and heard noises in the kitchen and smelled coffee brewing.

She leaped up and ran to the mirror on the far wall, and there looked into the fresh smooth face of Marilyn Case, her unfashionably long blond hair flowing to her shoulders.

"Good morning," said Claire from the dining-room door. She looked worried and suspicious. "Breakfast will be ready in a few minutes."

"I'll help you," said Marilyn. She doesn't want me here anymore. But why did she change overnight?

During breakfast Claire gave her suspicious glances and finally said in a loud voice: "Did I dream it or what?"

"What do you mean?"

"Last night. Who was that on the sofa?"

"I slept there all night. What's wrong?"

Claire shook her head. "Last night I woke up cold and came in here to get an extra blanket from the chest. There was a strange woman on the sofa. There was enough light from my bedroom to see that she was middle-aged, grey-haired, and badly scarred. It wasn't you."

Marilyn felt a chill in her heart. There was no chance of a mistake. She had reverted to the old Marilyn Gibbs while she was asleep. Had Dr. Narses not known this, or had he just not told her? This must have been what he meant about her coming back to him.

Claire broke the silence with a forced laugh. "Don't worry about it, Marilyn. It must have been the dim light. Maybe I was deaming."

Marilyn pushed back her fear and looked for Dr. Narses that morning, to see if he could complete the transformation. She had unexpected trouble in finding his apartment, for the buildings in that section looked very much alike, but after more than an hour of searching she did settle on what seemed to be the right building and rang the caretaker to the outer door. Dr. Narses? Never heard of him. She knocked on the door of Dr. Narses' apartment over the caretaker's protests. An old man living there? Yes, but that was long ago. The old man had been dead for years. The caretaker unlocked the door and slowly swung it open.

The room was dim and empty, and only that sweet smell which might have been mold remained of him. She recoiled and ran downstairs to the street. "What was I thinking of?" she whispered. She had gone on an impulse, and now she knew that the last thing she wanted was to see Dr. Narses. She had no money to offer him, and all she could expect from him was the proposal of a degarding bargain. Of course the caretaker had been bribed to lie. Even though she was fearfully thinking of some way of getting out of Paris and away from Dr. Narses, her good spirits were returning. The reversion and nightmares it brought on might pass in time. Now it was enough to be young and alive.

She hurried down the sunlit street that morning, and she had hurried ever since. She had no money and no usable passport, so

she advertised for a job as governess and was taken by an American couple with two small children to Nice. Usually she had a room to herself, and on those occasions when she had to sleep in the room with the children, she tied up her head in a scarf and caked her face with a white skin preparation.

Soon after she reached Nice, an envelope came by mail addressed to Miss Marilyn Case in care of her employer. It contained a brief newspaper article describing the mysterious disappearance of Mrs. Marilyn Gibbs, now presumed dead. The leads given the police by Mrs. Gibbs' lawyer, Mr. Remington, had led nowhere. So the only person who knew she was Mrs. Gibbs also knew where she was.

She had moved on from one city and job to another, from fear of Dr. Narses. A year later she was working in the Marseilles office of an American export company and already planning to move again although she enjoyed this job as she had her other jobs. She loved life. Her youth was no thin facade. Emotionally she was nineteen—enthusiastic, responsive, naturally happy. She was fond of her many suitors, but she would not choose among them, for the right man had not appeared. She knew with increasing certainty that she had wanted youth and beauty only to gain love.

She found love at a party in Marseilles, attended mostly by the American colony there. At such parties she sometimes met people whom she had known as Mrs. Gibbs, and she looked forward to a peculiar kind of fun from such encounters. The hostess that night was a woman she had known slightly in former times. "Marilyn, dear," she said at the door, "I met a young American, a wine importer, and invited him tonight with you in mind. He doesn't know anyone, so would you watch out for him and take care of him? His name is John Haskell."

The party had been going on for about an hour when he arrived. Three young men surrounded Marilyn, competing for her attention. As soon as the stranger came in, he looked around, and as his gaze moved over the room, Marilyn lifted her head in greeting and smiled at him. Smiling, he bowed slightly and made his way toward her through the crowded room.

"Excuse me," she said to her three companions, and she hardly saw their disappointed faces as she floated toward the stranger, her

skirts rustling. I hadn't exactly counted on love at first sight, she thought. But she couldn't hesistate. She had been waiting for this feeling too long. She could feel the pull of his presence, and she wondered if the other women there saw how handsome he was. "I'm Marilyn Case," she said to him, her face hot with excitement, "and you must be John Haskell."

He was. Close up he looked even better—weather-beaten, lean, crewcut, perhaps thirty years old, an American who had spent some time abroad by his accent. Mentally she subtracted nineteen from thirty and decided that eleven years was a pretty good difference in ages.

"May I get you some champagne?" he said. "And after this, Miss Case, may I take you out? I haven't been here long, and maybe you could show me the places to see—the bright lights of Marseilles."

She could not take her eyes off of him. "I'd be delighted." This is reckless, she thought, but it will be the most wonderful evening of my life. She was right. The gay whirl around John Haskell for the next two weeks made her forget her nightmares and Dr. Narses. Yet when John asked her to marry him, she said she didn't know and left him suddenly sobered and worried. Her fear increased as she thought about it. She did not know and had no way of finding out how soon after she went to sleep the transformation began or how complete it was. Perhaps it was only a matter of facial expression, but that was enough. By the time she was awake enough to see herself in the mirror she was herself again. Caked-on skin cream and a scarf around her hair could fool casual roommates, but a husband would soon know the truth. No, if she married him, John was bound to see her asleep. His love may change me, and I won't revert again, she repeated to herself. But she knew better than that from her dreams. I have no right to do this to a fine man like John, she thought, but I can't let him go.

They had been married in Marseilles, and an hour later flown to New York. She had wanted to leave France, and marriage to an American citizen and much arranging had prepared her way into the United States. Her involved lame explanation of her mysterious background and lack of identity had not troubled a man so much in love.

In her excitement on the flight across the Atlantic she had had

no trouble staying awake, and last night in New York she had waited until she could hear his heavy breathing in the darkness and crept out into the sitting room. There she rigged a trap, so that if he opened the door, he would upset a heavy brass ashtray. Then she lay down wearily on the sofa and fell into twisted dreams of her old life.

She awoke at the crash of the ashtray, and in the grey dawn light, she saw John, clad in pajamas, standing in the door. "What is it, darling?" he said. "Did I thrash around and keep you awake?"

"I'm afraid you did."

"We'll have twin beds tonight at the hotel in Florida."

That won't do, she told herself, her heart racing. She spent that day in a state of increasing fear. The trip south on the airliner passed in a cloud of fatigue, and she felt intolerable twinges of guilt at the perplexity on John's face. You snore, she said to herself, I must have a separate room. It was on the tip of her tongue, but she couldn't say that to a bridegroom. She could use that later as a permanent excuse.

When they got to Florida, she found to her horror that the room at the Olympia had twin beds and no sitting room. That was when she had asked for a separate room—and he had refused it. Now sitting beside him on the bed, she thought with wonder how she had been married to him less than forty-eight hours. In the drowsy heat of southern Florida she could not pass another night without sleep. She wondered if this fatigue made her more suggestible to John's suspicions that some man was following her. It was true that since her rejuvenation, her remarkable beauty had attracted attention and caused men, particularly Frenchmen, to follow her on occasion. But now, perhaps because this hotel like all of southern Florida was full of very old people, she was constantly reminded of Dr. Narses, haunted, and at moments convinced that she was being followed—that Dr. Narses was actually there.

That night she waited, perilously close to dropping off, until John was asleep. She dressed and crept out, woke the desk clerk, and arranged for another room. She set an alarm clock for five o'clock, fell on the bed without undressing, and immediately sank into a mire of troubled dreams.

Pounding on the door awakened her. She sat up. It was dark,

and the clock's luminous dial showed two o'clock. She unlocked the door to admit her husband. His handsome clean-cut face was rough with a stubble of beard and drawn into a scowl. He strode across the room and threw open the closet door. Then he stooped and looked under the bed. "John!" She walked to him to put her arms around him, and he brushed her away angrily.

"Where is he, Marilyn? That's right. Get the tears started. That ought to fix everything. When a bride won't sleep in the same room with her husband, something's wrong." He strode around the room waving his arms. "Explain this: last night in New York, you fixed that ashtray as a warning signal. Whom were you warning? I want the truth." His face was white. "What is it? Has somebody you were playing around with in France followed you down here?"

"It's nothing like that!"

"You came here to meet someone. We'll wait for him. If that man comes back or I catch you trying to send him a message, I'll kill him—and you! Now sit down."

She looked in amazement at his wild reddened eyes. He means it, she thought. He sat down across from her and stared at the wall. She felt like screaming from fatigue. I don't feel young, she thought, I feel horrible. It must show. But the mirror said otherwise. She looked worried and unhappy, but her beauty remained, her eyes clear, her skin fresh and glowing. I will last it out today, but what about tomorrow and the day after?

He would not look at her, but sat brooding, jumping at every sound in the corridor. She was afraid of him, but still loved him and could not regret marrying him. He was exactly what she had wanted, and in spite of the barrier between them now, she felt an unbreakable spiritual bond with him.

When three o'clock clanged and no lover had come, he breathed deeply. He was tired too, and at any easing of tension he would grow sleepy.

She had lost so much sleep, and her eyelids kept falling, her head sinking down and quickly jerking up. She tried standing up. "Sit down," he said. "Get away from that window." She sat down and waited.

The little leatherbound clock ticked softly on the bedside table. It was now nearly four. Automobiles passed on the highway, over-

head she heard people talking and laughing, and the ocean slapped softly in the darkness.

She heard feet shuffling in the corridor. The tread seemed slow, painful, familiar. Her heart hacked away in her breast, and she listened breathless. He's here, she thought. She whirled and looked at John. He had not heard. She saw by the dim lamp that his eyelids were drooping. She got up and put her ear against the door. Already the footsteps were dying away. She sighed and turned off the lamp.

The room was still not dark enough. The light from the windows would reveal her if he woke up. I must tell him, she thought, I can't stand this. But she remembered the way she had looked, and she knew he couldn't love her if he saw her that way. I'd rather he killed me than stopped loving me, she thought.

His head drooped, and his breathing was loud. He was asleep. He too had lost a lot of sleep from worry. Poor John, she thought, you deserved a better honeymoon than this.

She went to kiss him goodnight, and as she leaned over him, a familiar smell gagged her and made her heart freeze.

Her eyes were getting used to the darkness now, and she saw that the bony face her lips had touched was beaked and old, the eyes and cheeks sunken, the neck shrivelled. Thin hair hung in loose strands over the skull. It was Dr. Narses.

He didn't know what happens in sleep; he really thought I was unfaithful to him. She backed away. What dusty dreams was he wandering through now? They must go back under the accumulated filth of centuries to the beginning of time.

She lay on the bed and closing her eyes tried to shut out her new youth and return in dreams to that dim time before she had known Dr. Narses.

■ BOOKS

The Evolution of Evolutionary Thought

By STANLEY MARION GARN

A hundred years ago come next November, Englishmen queued up to buy a book, and a book of science at that. They knew its author, for Charles Darwin had a wide reputation as a naturalist and man of letters. They knew the subject for the book bore the main title *The Origin of Species by Means of Natural Selection*, and the trailing subtitle, *The Preservation of Favored Races in the Struggle for Life*. Besides, those Londoners who rushed to purchase the *Origin* on November 24, 1859, and the disappointed late-comers who stalked stationers and railway bookstalls had heard of the Darwin-Wallace paper of the year before. A major intellectual event had transpired in England, and the literate public wanted to become informed.

Since that day a century ago, a small stack of books has been written about Darwin and evolution. Victorian authors penned numerous volumes about, for, and against organic evolution, and further described Charles Darwin, M.A., LLD, F.R.S. of Kent. With outstanding exceptions, like Francis Darwin's *Life and Letters of Charles Darwin*, Osborn's *From the Greeks to Darwin*, and Romanes' *Darwin and After Darwin*, these older works gather dust today. The early years, (1859-1900) were rarely propitious either for biography or evaluation. Then, for the next three decades classical Darwinism became overshadowed by the evolving science of genetics, and interest in evolutionary mechanisms temporarily waned.

There is at present no standard biography of Darwin; all scholars refer to the autobiographical chapter in the *Life and Letters* still available on the second-hand stalls, newly in an inexpensive abridged edition by Dover, and in several more expensive editions (variously edited or introduced) by Basic Books and other publishers. The *Autobiographical*

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Chapter, of course, was censored by the Darwin-Wedgewood assemblage, which also sat as a review board on Charles Darwin's writings during his lifetime. Recently, Nora Barlow, one of the grand-daughters, has restored the missing lines, in an edition entitled the *Autobiography of Charles Darwin*.[1] No great secrets and no dire mysteries were hidden in the deletions from the 1876 autobiography. Far more valuable is Nora Barlow's appendix on the one-sided Darwin-Butler "controversy," wherein Samuel Butler, his feelings bruised, hurled barrage after barrage at an unresponding Darwin, silenced, we learn, by family decree.

For many years Geoffrey West's lively *Charles Darwin: A Portrait* has been preferred over the two biographies by Hesketh Pearson and the mathematician, Karl Pearson. Ruth Moore, a Chicago journalist, recently added the small but serviceable *Charles Darwin* to the list. However, it was inevitable that someone representing British evolutionism would again try his hand at the task, and eventually Sir Arthur Keith, the late and eminent anatomist and authority on fossil man, joined the list.[2]

For Sir Arthur, the early evolutionary controversy was not history-passed; it still raged when he was a medical student in Edinburgh. As a describer of fossil men Keith helped to document ideas advanced in the *Origin* and later detailed in the *Descent of Man*. Keith lived from the period of evolutionary romanticism through the years of scepticism and into the new era of evolutionary genetics. Nevertheless, and despite its title, *Darwin Revalued* is neither an evaluation nor a revaluation of Darwin but rather a formal, conventional biography with much new and much interesting information. Living at Downe, close to Darwin's "Down House" at Kent, with unique access to Darwin's family records, Sir Arthur was able to peruse documents unavailable to earlier biographers, though not of astounding import.

Sir Arthur Keith was a good writer from his earliest semi-popular works on, and his biography of Darwin reads well. By adroit selections from Darwin's extensive correspondence, plus paragraphs from the *Autobiography*, an event is given flesh and bones. On some point we hear Darwin speaking, then Emma Wedgewood Darwin, and then a personal item, like the cost of beer, wine, or music lessons. The account of Darwin's experience with Dr. Gulley, he of the famous water-cure, is most fascinating. Inevitably, Sir Arthur, perusing Darwin's dyspepsia to its

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[1] *The Autobiography of Charles Darwin. With original omissions restored.* Edited by Nora Barlow. Harcourt Brace and Co., 1959. $4.00.

[2] *Darwin Revalued.* By Sir Arthur Keith. The Humanities Press, 1955. $5.00.

origins, makes a diagnosis, but like the psychoanalytic writers, he does not explain how Darwin remained so tremendousy productive, beset by ills for so long.

Today, in the shadow of the Darwin centennial, much capital is made of the anniversary year. Letters, articles and papers in the public domain are being reprinted in hopes of capitalizing on the Darwin name. There are Darwin "samplers," Darwin "readers" and books about books about Darwin. In all of this, Professor Bert Loewenberg, a historian, has two entries, *Darwin, Wallace and The Theory of Natural Selection*[3] and *Charles Darwin. An Anthology of Readings.*[4] The first reprints the Darwin-Wallace paper of 1858, along with an introduction and numerous attractive, if unrelated, reproductions of woodcuts culled from here and there. The second, also illustrated, adds letters, facsimile pages of manuscripts, selections from various of Darwin's works, and bits by Wallace and by Thomas Henry Huxley.

Darwin, Wallace and the Theory of Natural Selection won prizes for its typographical excellence, but wins no praise (on this account) from the reviewer, who objects to pages printed on the lower half only, even if giraffes, whales, and lizards occasionally cavort across the upper halves. Reprinting the Linnean Society paper commends favorable comment however, though this paper can also be found in Hall's *Sourcebook*, and other texts. The *Anthology*, with four times as many pages (and nearly the same price) is a more valuable acquisition, even though the selections do not add up to a comprehensive whole. As a leisure-hour reader, however, this anthology yields much relaxed pleasure. Even the case-hardened and unmalleable will grin a little at the letters concerning Charles Darwin's impending marriage in 1838.

Apart from biographies, studies of Darwin the man, and new editions of older Darwin works, there have been repeated attempts to describe Charles Darwin, his times, and his impact on contemporary evolutionary thought. Sears' *Charles Darwin: the Naturalist as a Cultural Force* was successful in large part because it was written by Sears. Irvine, in his *Apes, Angels and Victorians* evidenced gastric as well as cerebral distress. How could Irvine identify with a dissector of barnacles, "nasty smelly things," even though the barnacle episode was one of the most important

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[3]*Darwin, Wallace and the Theory of Natural Selection. Including the Linnean Society Papers.* Edited by Bert James Lowenberg. Arlington Books, 1959. $5.00.

[4]*Charles Darwin: Evolution and Natural Selection.* Edited by Bert James Lowenberg. The Beacon Press, 1959. $5.75.

in Darwin's career, and yielded a delightful anecdote to boot? In contrast, Loren Eiseley,[5] anthropologist, evolutionist and historian of science is uniquely fitted for the task of describing Darwin, the men before him, and those who followed. Eiseley writes a very, very Victorian prose, and *Darwin's Century* has the warm flavor of a nineteenth-century work. This illusion is heightened by the sepia-toned end-papers that resemble the collotypes of the century past.

One virtue of *Darwin's Century* is the description of other, long-forgotten scholars who also came to recognize the importance of natural selection. There is William Wells and, in particular, Patrick Mathew, who hid a theory of evolution in the depths of a book on naval timbers. It is this book that Darwin mentions in one of his letters, admitting Patrick Mathew's priority, but excusing himself for not having read such an obscure work with such an unlikely title! Moreover, Professor Eiseley, who has written extensively on the reception of the first "missing links," devotes a chapter to this most interesting subject, but without citing his own important contributions either in the references or the chapter footnotes. The bibliography to *Darwin's Century* is a particular delight, including many unpublished dissertations that even the scholar would be likely to miss. Since the term "scholarly" in review parlance is too often a synonym for "dull," let us add that *Darwin's Century* is never dull, but rather eloquent, and a pleasure to read.

In contrast to the many descriptions of Darwin, his life and times, much less has been written for the general reader about the impact of Darwinian thought. The last group attempt was edited by H. H. Newman and published by the University of Chicago Press. Such major collections as *Evolution, A Modern Synthesis*, Jepsen's *Genetics, Paleontology and Evolution*, and Huxley's *Evolution as a Process* have been directed at the specialist and the student. An exception, of course, is George Gaylord Simpson whose *Meaning of Evolution* became a book-club selection in 1950, and more recently a timeless paperback. A new book, *A Century of Darwin*,[6] the contribution of the Harvard University Press to the Centennial Year is unlikely to achieve comparable success but it is a jewel, a gem, and otherwise valuable.

In all, fifteen specialists contribute their bit to *A Century of Darwin*, and the roster is distinguished indeed. Two of the authorities, Sir Wilfred

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[5] *Darwin's Century: Evolution and the Men Who Discovered It.* By Loren Eiseley. Doubleday and Company, Inc., 1958. $5.00.

[6] *A Century of Darwin.* Edited by S. A. Barnett, Harvard University Press, 1958. $5.75.

LeGros Clark and Sir Gavin DeBeer, have been knighted for their scientific endeavors. Moreover, these luminaries prove remarkably able at writing about evolution in simple, uncomplicated terms. Admitting the reviewer's own bias, Dobzhansky's essay on species is especially outstanding and the chapter by DeBeer (author of *Embryos and Ancestors*) is a true delight to read. *A Century of Darwin* also includes the behavioral and social sciences, and that branch of philosophy called Ethics. Should there be any who still maintain that the mental and moral qualities of mankind cannot be explained by natural selection, the essays by S. A. Barnett and Donald MacRae in *A Century of Darwin* are called to their particular attention.

Darwin Revalued will have a steady sale, Darwin Centennial or not, but how will *Darwin's Century* and *A Century of Darwin* fare? I wonder how many men and women out of college or beyond graduate school will read them. To the literate but eager few of Darwin's own century, keeping up with science was part of the intellectual experience; to them science was one of the humanities, and exciting in addition. Today, it is otherwise, the sciences being collectively confused with technology, even by academic leaders. Yet the promise of adventure afoot that spurred Londoners to buy out John Murray's stock of the *Origin of Species* has been most amply fulfilled. We understand the world we live in far better because of Charles Darwin, and we are beginning to understand ourselves too. The ceremonies and speeches of this anniversary year, the retracing of the voyage of the "Beagle," the handsomely-illustrated, though limited, essays on evolution in *Life*, and such excellent guides as are reviewed here, may kindle a new laymen's interest in the tremendous intellectual feats of our time.

Beat-up or Beatific?

On the Road. By Jack Kerouac. Viking, 1955; New American Library edition, 1958. *The Subterraneans*. By Jack Kerouac. Grove Press, 1958. *The Dharma Bums*. By Jack Kerouac. Viking, 1958.

With the publication of his fourth novel, Jack Kerouac is approaching the status of a literary hot property. His name has come to be associated with something which is going on in American life and which involves, or shocks, or intrigues a sufficient number of people to create a market for books about it. This something is known as the "beat generation" and Kerouac is known as its spokesman and celebrant.

To the outsider, fitting this beat generation into any coherent or familiar scheme of American culture takes quite a bit of doing. It has been said that this group is not so much in revolt from society as in permanent secession. And perhaps we should leave the job of interpretation to field-work teams of anthropologists and linguists. Either you dig it or you don't. But these overage youths and assertively unglamorous women of the cities and campuses may be our neighbors or our children; they grew out of American life and their existence is a fact to be lived with. What they have to say—directly, in the words of Kerouac, or just by being here—should be listened to.

Kerouac's most sustained exposition of his group was in *On the Road*, which had a reputation even before it was published in 1955. Its characters "danced down the streets like dingledodies, and I shambled after . . . the only people for me are the mad ones, the ones who are mad to live, mad to talk, mad to be saved, desirous of everything at the same time, the ones who never yawn or say a commonplace thing, but burn, burn, burn. . . ." There is plenty of burning in this book. It has something in common with the hard, gemlike flame which consumed a previous generation, though often it is more like the explosion of a tar bucket. Keeping the flames leaping high calls for a great deal of speed, sex, alcohol, "that sound of night which bop has come to represent," marijuana, and yahooing around the appropriate nightspots.

It is not easy to look at the external and public nuisance aspects of the beat generation without lining up with the censorious elders. These young "haters of everything" can seem nothing more than spoiled brats, rejecting a civilization they have not bothered to understand and done nothing to deserve, wrecking lives and other peoples' Cadillacs with equal relish and for no reason at all, sponging on relatives they despise, and pretending a superiority which is only a big brag of loudmouthed nastiness. . . . But this is not listening to what they have to say.

Each of Kerouac's quarrels with American culture—or with what he thinks American culture is—is tied to a positive value. He thinks middle-class life is dull, anxious, and pointless: "not enough ecstacy for me, not enough life, joy, kicks, darkness, music, not enough night." (This one is mixed up with the wish that he were one of "the happy, true-hearted ecstatic Negroes of America.") He has had a bellyfull of "tedious intellectualness" and contrasts it with Dean Moriarity (his "new kind of American saint") and his "wild yea-saying overburst of American joy." Life should be more alive, more spontaneous. It should break through its cautious negations and its purse-mouthed string-saving to caper in the present—the great shouting intensities of direct experience and heightened sensation.

Well, gee whizz, who's arguing? We all want to be more alive, more free, more aware. What holds us back? Mostly a stubborn set of facts about human life. That it is *human*, to begin with: our standard factory equipment is inadequate for living until it has been shaped and tuned up by interacting in a human way with other people. And we go on living with other people, including ourselves. We can't live purely in the present and be human beings. The same is true of living purely for sensation, or purely within the single self. We aren't made that way. And because we aren't, we have all this baggage from the past—all these customs and laws and institutions. All of it is there because we made it, because we needed it or thought we did. At any given time, of course, much of it is junk. Rebellious generations have always led in the endless job of clearing out the junk, but Kerouac's boys and girls seem to want, not a clean house, but no house at all.

The test of the beat way of life, like any other, is in the way it works out. And even though Kerouac's rebellion may not be particularly new or intelligent, he rates high marks for honesty in following his new saints through their odysseys and reporting on the results. In fact, this honesty makes the celebration of Dean Moriarity in *On the Road* a very ambiguous achievement. The intention seems to have been to say: here is a "Holy Goof" whose life is a mess by all respectable criteria but who has "got the secret that we're all busting to find" and represents "the ragged and ecstatic joy of pure being." Which is the one supreme value. There is a climactic scene in which Moriarity is told off by his buddies and their disillusioned wives. He has meant trouble for them all and as they reject him he is shown "standing in front of everybody, ragged and broken and idiotic, right under the lightbulbs, his bony mad face covered with sweat and throbbing veins, saying 'Yes, yes, yes,' as though tremendous revelations were pouring into him all the time now, and I am convinced they were, and the others suspected as much and were frightened. He was BEAT—the root, the soul of Beatific."

So there we have it, and Kerouac's Sal Paradise is moved to be loyal to this beatific hero and they take off on one of their mad cross-country dashes. But the only heroism, the only saintliness visible in Moriarity is his frenzy of activity. His quoted conversation is babble; his rocketing from woman to woman, with an accidental child here and there, is not freedom but compulsiveness. He steals and cheats and lies. His one saleable talent is as "the most fantastic parking lot attendant in the world." We have only Kerouac's word to indicate that there is any "joy of pure being" involved here. The evidence shows little but desperation and mania and a beatness too overwhelmingly beatific for even his fellow madmen.

If it is hard to see what is admirable—on any terms, or by any measure—in this Kerouac hero, it is even harder to see the beat way of life as holding much joy for its women. They have a very rough time. Their only real functions are as audience and as erotic furniture (sometimes as providers and meal tickets). They may come along for the ride, but they don't dig the deeper secrets of life, and their demands for attention and consideration can be a real nuisance. And they turn out badly. They flip and they suicide; they become whores. Or they turn into nagging shrews who challenge the very basics of beatness by demanding regular hours and incomes from their men.

Kerouac's honesty about woman's place in the beat culture is devastating to his whole crusade for "a shining now-ness" which is to carry "America like a shining blanket into that brighter nowhere Already." Much of his gospel might seem a male revolt against the gracious-living quest of the middle-class woman, with her smooth certainties and her pitiful vulnerability. Some questioning of the viability of this kind of life is audible in the more literate suburbs, as some of these women go most ungraciously to pieces while their men hover helpless and wonder where they lost the way. Kerouac seems to speak to this unease when Japhy Ryder prescribes: "get a friendly smart sensitive human-being gal who don't give a shit for martinis every night and all that dumb white machinery in the kitchen." But on the evidence in Kerouac's books, the beat way of life is even more of a trap for women than the suburbs.

In Kerouac's latest (*The Dharma Bums*) there is less frenzy than previously. There is some feeling of "So the party was over and all the screaming was done and what was accomplished." Which would have been a heretical type thought in *On the Road*, with its "mad drunken Americans in the mighty land" who "fumed and screamed in our mountain nook." They had yelled "across the night, eastward over the Plains, where somewhere an old man with white hair was probably walking toward us with the Word, and would arrive any minute and make us silent." Silent they are not, so we guess the old man didn't make it. But there are two new elements in the beat culture. One is the oriental mysticism suggested by the title. (This I will skip; if there is meaning in "actually empty and awake throughout the emptiness and awakeness of everything," more competent hands can deal with it.) The other is the discovery of the great out-of-doors.

Japhy Ryder is a different kind of hero from Moriarity. He is trim and tight and full of camping and mountaineering lore, and he carries dehydrated foods in neat plastic containers. (This ritual superiority contrasts very funnily with his anxiety at being dressed improperly for a

roadside restaurant.) Japhy is organized and he is articulate. He expresses one of the key rebellions of the group, "refusing to subscribe to the general demand that they consume production and therefore have to work for the privilege of consuming, all that crap they didn't really want anyway such as refrigerators, TV sets, cars, at least new fancy cars, certain hair oils and deodorants and general junk you finally always see a week later in the garbage anyway, all of them imprisoned in a system of work, produce, consume, work, produce, consume. . . ." Rebellion at the bad bargain of trading life for junk is at least as old in American thought as Thoreau. And for most people, total secession is as useless an answer now as it was then.

For one thing, there are children; and if there *are* any villains in this work-produce-consume rat race, they are also our principal treasure and reason for being. It isn't TV sets and electric dishwashers which hold people to their jobs. If conformity and "other-direction" are rampant, they show their purest form among the pre-teeners. And our fairly recent tendency to make children an end in themselves doesn't seem to be working very well, for either children or parents. All of this is a much larger problem than the beat generation symbolizes, or understands. Tentative answers are shaping up all around us, but not from the seceders.

As a people, we have been trying to come to terms with industrial civilization for better than a hundred years. And even though Kerouac drops names right and left to show that he has been through all of human culture and left it behind him, he and his buddies show no understanding whatever of where we have been in this struggle. No one has told them about the Great Depression, for one thing—when the horizons of life contracted do you have a job, any kind of job? Such notions as freedom and self expression were remote and irrelevant beside the tightening paralysis of the early Thirties. (Did Kerouac ever hear about the woman whose family finally went on relief and who went out every morning with her broom and swept the sidewalks of her entire city block?)

Then the question was whether any kind of decent life was going to be possible without a bloody hell of revolution and a police state. We got over that hump, by whatever untidy means, and we shouldn't forget what an achievement it was. If the joy of pure being isn't always there for the taking today, and if we fret over the clutter of things in the marketplace (and the intrusion of the marketplace everywhere), let us nonetheless count our blessings. A little fasting might be good for us. But starvation is something else again.

There is irony in the fact that it is our lush abundance which enables a beat generation to avoid imprisonment in the "system of work, pro-

duce, consume." They get by on pickings from the system's leftovers, and on handouts from imprisoned relatives, while they shout their obscenities at the horror of it all. Here again, Kerouac is honest. His Ray Smith (there may be something hopefully symbolic in a protagonist named Smith, after Paradise and Percepied), on a rustic contemplative kick, "wasn't exactly unconscious of the fact that I had a good warm fire to return to after these midnight meditations, provided kindly for me by my brother-in-law, who was getting a little sick and tired of my hanging around not working."

There is a similar irony in the great grieved whining about conformity coming from a group so little subject to any kind of restraint. Most of this pressure to conform seems to be pressure from within, based on a very real fear of freedom. As a people we not only tolerate an enormous diversity of ways of living, we reward many of the deviants—as Kerouac must realize when he tots up his royalties. Freedom means making choices and accepting the consequences—one of which is that every choice eliminates alternative choices. To live in a maelstrom of differentness like New York and hear people complaining about conformity puts a strain on one's sense of reality. To be sure, those who are "desirous of everything at the same time" are in for frustrations. But this is simple arithmetic—not new, surprising, or a plot of the organization men.

Kerouac has no real answers to the larger problems of living in modern society. But he takes it for granted that this society will always be there to be used and outwitted and escaped from. His current attitude is more hopeful and less end-of-the-road nihilistic than it was. But the hope seems to go no farther than a generation of Dharma Bums roaming the wilderness with sleeping bags and rucksacks, as somehow a sufficient end in themselves. Possibly there will also be a few "lay brothers . . . who live normal lives with wives and children and homes." Possibly; one requirement is a wife who is "an expert on making food out of nothing."

Unarguably, there is work to be done to find ways of living with industrialism which enrich and fulfill. The basic disciplines of the industrial process (time, impersonality, and co-ordination) are not to be avoided, but the human involvement in the process is changing all the time. The inhumanities which, a generation ago, were being charged to The Machine have been eased by further mechanization and by union organization. Today's working stiff has an easier, more abundant life than many semiprofessionals. Today's crying human indignities seem to center in marketing and all the hoopla it has come to require. Once the basic knowhow of making and moving is functioning, there is, in truth, nothing very humanly substantial in the process itself. Life has to

get its bite and flavor elsewhere and if we have to learn this from Kerouac and his pals, we should be grateful for being told.

As the Alger-book eager beaver fades as a folk hero, and life looks less like pure individual grabbing, we are increasingly concerned with each other. You can sneer at this as "other-directedness" or you can see it as clear gain in understanding. All sorts of factors enter in: the diffusion of the psychological approach (or at least the diffusion of the jargon); the welfare state and its institutionalizing of personal difficulties; the dissolution of the patriarchal family into togetherness; a population increasingly on the move; the effect of universal television, and so on. This heightened interacting is a fact and is also reflected in the beat credo. Though the more popular forms of this interacting are beneath beat contempt, there is much talk in Kerouac about "really communicating." The examples given are not very convincing (there is a polyphony of monologue but no one seems to listen), but it is notable that at their maddest his crowd do not actually knock each other's physical brains out, as a bystander might expect. They blunt their conflicts in drink and drugs and what passes for a great sad common compassion.

This matter of human relationships is one other place where Kerouac's reporting conflicts with his preaching. On the evidence submitted, his Subterraneans and Bums do a lot of milling around but the level of interaction is as ritually arid as George F. Babbitt's Boosters in solemn conclave assembled. Nothing is more irritating in Kerouac than his wide-eyed celebration of infantilisms as profound discoveries. Essentially, *The Subterraneans* is the story of a tentative approach to love (in the middle of a welter of promiscuity and roaring nonsense). The possibilities of love are dimly perceived even as they are being goofed up and lost. And this is all very deeply sad and unprecedented.

It isn't entirely fair to Kerouac to reduce his books to rational-sounding propositions and to look at the result. He doesn't add up to much from this angle. His writing is intended to be larger than the simply rational and didactic, and it often succeeds in what David Dempsey called "a descriptive excitement unmatched since the days of Thomas Wolfe." At its best it has zest and vitality and a fine blaring poetry. At its worst it is blah pure and undefiled. Kerouac believes in "spontaneous writing" or Pouring It All Out. The trouble is he leaves it there, all, as poured. Capturing in words some approximation of the full flow of consciousness is no mean achievement. But to empty a mind on the counter like a lady's handbag creates only a jumble of knickknacks unless the mind happens to be a first-rate one.

There is a built-in conflict in Kerouac's writing. He celebrates pure sensation, timeless absorption in the living Now, and direct mindless experience. But he tries to do this by writing words on paper—inescapably a cerebral, laborious, lonely operation. People who really live in the present don't write books. One of the ways in which Kerouac meets this dilemma is to write badly. Meanings are ignored, syntax is garbled, and form sprawls. (It is impossible to parody Kerouac; he has done it himself beyond improvement.) This negation of mind and language does sometimes suggest a great undefined Something, which may be what he is after. But a muted trumpet does it better.

So we've got problems. And life is seldom up to what we demand. This is new? Well, it is new the first time you come upon it. And if the beat generation doesn't see that this is an ongoing process, that we have come a long way, and that we are all part of the procession, maybe we haven't kept in touch with them (telling them too many ceremonial lies, hiding our own failures, shielding them from small troubles). Is their choice only between sterile respectability and more sterile self-destruction? This seems nonsense on the face of it, but that the question comes up at all is disturbing. We owe Kerouac some thanks for raising it for his fellows—though Kerouac himself is old enough to know better. He is even old enough to have read *The Crock of Gold* and noted the conversation between the shepherd girl and the Great God Pan. When the girl says, "One must find out all things, and when we find out a thing we know if it is good or bad," Pan says this may be the beginning of knowledge, but the beginning of wisdom is carelessness.

"'And what is the end of wisdom?' said she.

'I do not know,' he answered, after a little pause.

'Is it greater carelessness?' she enquired.

'I do not know, I do not know,' said he sharply. 'I am tired of talking,' and, so saying, he turned his face away from them and lay down on the couch."

—Freeman Champney

On Power and the Unification of Politics

Political Power and the Governmental Process. By Karl Loewenstein. University of Chicago Press, 1957. $6.00.

In politics, as in Christian fable, there is a continuing quest for the Holy Grail—for a principle or an approach that will unify the several fields that now divide the discipline. Professor Loewenstein believes that power, or the ways in which power is gained, exercised, and controlled, constitutes that unifying principle. This book is his effort to explicate this threefold dimension of power within the framework of the two major political systems of democracy and autocracy.

In this respect Loewenstein repudiates those schools of political thought which focus, instead, on the principle of justice. He is committed to the modern rather than to the classical tradition; consequently, he seeks to describe rather than to prescribe, to build on what men do rather than on what it may be thought they ought to do. Unfortunately, it is not at all clear that so clear-cut a dichotomy can be sustained; and it is one of the difficulties of Loewenstein's book that the normative and empirical aspects of politics are frequently confused. The bulk of his book, for example, is addressed not to the classification of governments but to the problem of the control of power, on the assumption that "uncontrolled power is evil as such" (p. 8). But this is a moral rather than a sociological precept; and it is interesting to note that Loewenstein asserts but does not attempt to establish the validity of this fundamental assumption.

(It ought not to go unobserved, too, that for an empiricist Loewenstein assumes a great many things: that every state is "controlled" by a managerial elite; that Rousseau was a totalitarian; that a political party is a group of people holding similar ideological beliefs; that sovereignty, even under a federal system such as we know it in the United States, is indivisible; that the Portugese dictator Salazar is an honest, efficient, and non-fascist ruler. These and similar judgments are at least questionable; but Loewenstein does not attempt seriously to sustain them.)

One other preliminary remark needs to be made. This is that Loewenstein is all too prone to indulge in that ambiguity of language which obscures rather than reveals his meaning. Take, for example, his definition of sovereignty as "nothing else, and nothing less, than the legal rationalization of power as the irrational element of politics" (p. 4). I have worried a good deal over this definition and have decided, reluctantly, that I do not know what it means. I have, to be sure, looked elsewhere in these pages to discover what Loewenstein might mean, but there was little to

help me other than the suggestion that the sovereign is the ruler, or power-wielder, or decision-maker. But many who are not "rulers" wield power and make decisions; who then is sovereign? Loewenstein answers: "He who is legally entitled to exercise *or* who ultimately exercises political power in the state community" (p. 4; my italics). But since communities generally boast both a formal or legal ruler *and* an informal or actual ruler—e.g., Louis XIII and Richelieu—who in Loewenstein's terms is the sovereign? His definition tells us that it is one *or* the other, but not which one.

Let us turn now to Loewenstein's classification of governments or, as he prefers to call them, political systems. By a political system Loewenstein means patterns of government linked together by a similar ideology and the institutions corresponding to it. Of such systems he distinguishes two—autocracy and constitutional democracy—the difference between them turning on whether, in the various stages of the governmental process (i.e., gaining, exercising, and controlling power), political power is shared or concentrated. Within the system of concentrated political power (autocracy), he distinguishes three patterns of government—absolute monarchy, Napoleon's plebiscitary Caesarism, and Neopresidentialism. Within the system of shared political power (democracy), he locates six patterns—direct democracy, assembly government, parliamentarism, cabinet government, presidentialism, and directory government as in Switzerland. It will be noted that while Loewenstein's primary division into autocracy and democracy departs from the classical division that turns on number (i.e., whether it is a government of one, or of a few, or of many) and on virtue (i.e., whether the ruler acts in the interests of a part or of the whole), it is similar to R. M. MacIver's division between democracy and oligarchy, which turns on whether or not the few who rule are responsible to the many. It will also be noted that Loewenstein limits himself quite rigidly to an analysis and classification of *political* power; he minimizes or ignores the relations between political power and other forms of social power—e.g., the economic, the military, the religious. It is true that in his concluding chapter Loewenstein addresses himself to the interplay between the government and non-governmental power groups; at one point he even says that "the border lines between the economic and political interests have become obliterated" (p. 350); but in his system of classification such considerations are basically left aside. And nowhere does he examine seriously the merits or implications of those positions which hold that political power is either a subordinate element in the total scheme of power (e.g., the Marxists) or that it is at best a co-ordinate element (e.g., C. Wright Mills in his *Power Elite*). This is all the more surprising in view of Loewen-

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stein's admonition that in classifying governments we must look at the realities of each situation. What Loewenstein means by realities, however, are the informal rather than the formal arrangements within *political* power systems; and while these are surely necessary they are not likely to be sufficient. A comparison of Loewenstein's analysis with MacIver's treatment of the pyramids of power in his *Web of Government* will make this abundantly clear.

Loewenstein's treatment of the control of power, by which in the first instance he means the control of political power, rests on the premise that uncontained power is destructive of rights. But Loewenstein does not explain what he means by rights; he does not distinguish natural rights from rights guaranteed under a constitution or rights held to be intrinsic to the principle of government itself. Consequently he does not make clear in what sense uncontrolled power may be said to be evil as such. Given his assumption and loose usage of the term rights, however, how does he propose to control political power? Primarily through the constitution, through built-in restraints that assure the sharing rather than the concentration of power. "Human nature being what it is," says Loewenstein, "such restraints cannot be expected to operate automatically; . . . it cannot be expected that the power holder, or holders, by voluntary self-restraint, will protect the power addressees and themselves against the destructive use of power" (pp. 8, 123). But this assumes a theory of human nature which Loewenstein does not bother to articulate or defend; once again he is content to assert what needs to be established. This also rejects out of hand a long, and some would add distinguished, tradition which holds that power can be restrained not by other powers—for what then restrains the greater power?—but by seeing to it that power is entrusted to the right man (whether a philosopher-king or a democratic personality), or that the rulers are committed to the right morality (e.g., natural law), or that the social order is constructed on right principles of organization (e.g., socialism). All of these alternatives may in fact be quite inadequate (as I believe they are); my point is only that Loewenstein does not consider them, and his failure to do so cannot be convincing to those who hold such positions.

It seems to be enough for Loewenstein that power is shared. "Because it is shared, the exercise of power is *necessarily* controlled. It is an elementary truism that, if two minds have to make a decision, one mind alone cannot prevail" (p. 29, my italics; and see further p. 50). But is this a truism? Is power *necessarily* controlled when two minds are required to share in the decision-making process? In a formal sense, perhaps so; but this is surely to ignore the realities of power. For, on the one hand, deadlock may result, in which case no decision may ensue; and

the absence of a political decision, far from controlling power, may have the effect of continuing the status quo, of perpetuating an already-existing power relationship. Thus, if the American Congress and the President cannot agree, a business corporation may remain free to abuse its employees, or a labor union to discriminate against certain minority groups. On the other hand, the two minds may be formally equal but actually unequal. One of the two may dominate the other, in which case the constitutional requirement is of little consequence. In either situation, I fail to see that the sharing of power as such is a sufficient bar to abuses of power. If it were, one would have to conclude that abuses of power do not exist in constitutional states; and this, if we regard the treatment of minority groups in the United States, for example, would surely be an absurd contention. Loewenstein comes close to admitting the inadequacy of institutional arrangements as a sufficient check on power when he asserts that the institutional apparatus of both autocracy and democracy has in our time become stereotyped to the point of identity, and that autocracies can and often do function under a constitution. In one place he even concludes from this that not institutions but the recognition and protection of fundamental liberties are the decisive element of distinction between the two systems (p. 317). But he does not ask what it is that then assures the maintenance of these liberties. For if it is not the functional arrangements of a society—not a system of checks and balances and the general dispersion of powers—the key to the control of power must lie elsewhere. But Loewenstein does not, and in his scheme of thought cannot, tell us where this is.

In his concluding chapter Loewenstein argues the necessity of public regulation to control the abuses of private powers—of socioeconomic groups as well as of political parties. In this respect he accepts the quite simple and traditional imputation of responsibility for abuses of power by private groups to government: for if private powers endanger individual rights it is said to be because government permits them to do so; hence the corrective is for the government to interfere with such private acts. But apart from the obvious consideration that this might produce a new and even more dangerous Leviathan—a danger that Loewenstein recognizes—it is noteworthy that Loewenstein does not inquire into the internal arrangements of socioeconomic groups; he does not explore the possibility of establishing democratic controls within private organizations. More than this, he does not take into account that in a democratic state the government may be constitutionally required to let many things alone, or that the climate of public opinion may be such as to prevent a government from interfering effectively even where the government might be so inclined. (The problem of

desegregation in the American South is a case in point.) A democracy, that is to say, if it is not to commit suicide by becoming a totalitarian state, must be prepared to leave certain areas alone; and where some powers are free, or partially free, the likelihood that they will abuse the powers left to them is always present. In a word, it is highly questionable whether abuses of power can ever adequately be controlled. This is not to deny the possibility of controlling particular abuses of power in particular situations. It is only to suggest that we are not likely to get very far if we formulate the question as one of controlling abuses of power as a general phenomenon.

I have not attempted to deal here with the many perceptive observations that the reader will find in this book. I have sought rather to judge Professor Loewenstein's work in terms that he has set for himself—as a unifying work in political science. If I do not believe that he has succeeded in his enterprise, it is less because of what he has done than because of what he has failed to do: for power without justice is not only an insufficient principle on which to ground an ancient and still (I venture to think) architectonic discipline; it is not even a brutal principle; it is simply an impossible one. And power with justice can have relevance only where it is seen that the problems of power are both more than political and less than general.

Cornell University —David Spitz

Book Notes

The following dialogue, which never took place, has no particular scene.

Publisher. I wonder if book reviews in such quarterlies as your *Antioch Review* stimulate reading.

Editor. You mean, do they stimulate the sale of books.

Publisher. Most books are written, therefore must be published, because it is hoped readers want them.

Editor. But I gather by your tone that book reviews are of no service.

Publisher. Oh, they're a *service*—but for people very likely who feel guilty about *not* reading.

Editor. Even the best review cannot substitute for the book itself.

Publisher. But it is a substitute too many non-readers—intelligent non-readers, I must say—guiltlessly accept. How often one hears the remark, "No, I haven't read the book—but I've seen the reviews."

Editor. Well, to talk of reviews is to talk of books—and talk of books must depend, ultimately, on reading. How explain *Doctor Zhivago* and *Lolita* riding at the top of the best seller list?

Publisher. Easy. Those two make the news columns as well as the reviews.

Editor. Not Aline Saarinen's *The Proud Possessors* (Random House),

pretty much a special book about art collectors, which is the most enjoyable reading I've had in months. More amazing is the Kimon Friar translation of Nikos Kazantzakis' *The Oddysey: A Modern Sequel* (Simon & Schuster). The sales of that surprised the publishers themselves.

PUBLISHER. Books are published because of enthusiasm—and sell because of enthusiasm.

EDITOR. I see. . . . You're complaining that reviews too often fail to generate enthusiasm?

PUBLISHER. Too often they satisfy curiosity about books—and only that. Now, if you could simply *stimulate* curiosity—

EDITOR. Well, I've been having some satisfying experiences with some new fiction. There's Joyce Cary's last, *The Captive and the Free* (Harper). Although it's unpolished—he died before he could turn out his final draft—it's one of his best, quick in narrative, charged with his usual tension. And there's Saul Bellow's *Henderson the Rain King* (Viking), a disappointment, I think—I found it a bore—but it has to be read because Bellow is our most interesting young writer: one needs to follow Bellow, just to be ready for what he's going to do next. I enjoyed Pamela Hansford Johnson's *The Unspeakable Skipton* (Harcourt Brace), was enchanted by a first novel by a New Zealand writer, Sylvia Ashton-Warner who in *Spinster* (Simon & Schuster) catches for the first time what it is like to practice the art of being a teacher. Two other first novelists who are going to keep me interested—as interested as I am in their mature, solid worth on first appearance—are Evan S. Connell, Jr. with *Mrs. Bridge* (Viking) and David Dempsey with *All That Was Mortal* (Dutton). I should remark about all these.

PUBLISHER. Just go on.

EDITOR. Well, there are the translations. Publishers have never been so generous. *Confessions of a Mask* (New Directions) by Yukio Mishima is by a Japanese Gide, one would think. The younger generations are my special interest. I liked the Frenchman, Robert Sabatier's *Boulevard* (McKay) and the young Spaniard, Juan Goytsolo's *The Young Assassins* Knopf). There are two Americans, too—Lillian Hale with *The Pearl Bastard* (Braziller) which I read in one sitting, it being, thank heaven, short, only as long as it needs to be, a touching story of a fourteen-year-old-girl who has a baby; and *Acrobat Admits* (Braziller) by Alfred Grossman, funny and clever, probably too clever for its own good. And I never pass up a good short story collection. Rather, I can't pass up Ray Bradbury, who has out *A Medicine for Melancholy* (Doubleday). I'm glad, too, for Michael Aymé. *Across Paris* (Harper) is his first book of stories in English. Howard Nemerov's *A Commodity of Dreams* also shouldn't be neglected.

PUBLISHER. No non-fiction?

EDITOR. On the contrary. Take *The Civil War: A Narrative* (Random House) by Shelby Foote, the first of three; and *The Lincoln Nobody Knows* (McGraw-Hill) by Richard N. Current. I'm neither a Civil War nor Lincoln buff, but these two might convert me. As for the biographies, just for the good of knowing there is a happy human being in the 20th century, nobody should miss *The Autobiography of Mark Van Doren*

(Harcourt Brace). And another reasonably happy—also interesting—human is William Plomer. I liked his *At Home* (Noonday). Elizabeth Jenkins' biography, *Elizabeth the Great* (Coward-McCann) is distinguished and absorbing. The oddity in this category is *The Life of the Admiral Christopher Columbus By His Son Ferdinand* (Rutgers) translated and annotated by Benjamin Keen.

PUBLISHER. I wish *I* had time to read—other books than those I publish.

EDITOR. Some books have to be bought, simply to have them around so that they can be dipped into—books like *Reflections on Art* (Johns Hopkins) edited by Susanne K. Langer. Here is a collection, uncut, of essays on the arts impossible to have otherwise unless the owner of a huge and specialized library. A new annual collection, *International Literary Annual*, edited by John Wain (Criterion) can keep the reader *au courant* with its coverage of "what's happening" in world literature. I want to add to my library *A Dictionary of American Proverbs and Proverbial Phrases* (Harvard) by Archer Taylor and Bartlett Jere Whiting. I think I'll be reading, as occasion arises, *The Picaresque Saint* (Lippincott) the critical study by R. W. B. Lewis of such writers as Moravia, Camus and Silone, among others; as I shall need *The New Literature* (Braziller) by Claude Mauriac because I am too unacquainted with such literary figures as Artaud, Caillois, Cioran and Bataille. A. Alvarez in *Stewards of Excellence* (Scribners) covers familiar ground—Eliot, Yeats, Pound, Auden, etc.—but here is a fresh, independent critic. I am as pleased that we now have the collected criticism of Conrad Aiken, *A Reviewer's A B C* (Meridian Books). Aiken hasn't missed much—from Karl Shapiro to St. John Perse.

PUBLISHER. You never get tired of just new books?

EDITOR. Not if they turn me back to the old. Take *The Atlantic Book of British and American Poetry* (Atlantic: Little-Brown). Like everybody else, I quarreled with Edith Sitwell on her table of contents, but she startled and delighted me with her selections of early English verse. And George Steiner's *Tolstoy or Dostoevsky* (Knopf) which he calls "an essay in the old criticism"—"not to judge or to anatomize, but to mediate"—urges me to return to a complete re-reading of *Anna Karenina* and, in particular, *The Possessed*. This driving force came out of *The Journals and Papers of Gerard Manley Hopkins* (Oxford) edited by Humphry House and the third and final volume of *D. H. Lawrence: A Composite Biography* (Wisconsin) edited by Edward Nehls. It's a pity; moreover, it's unfair, simply to mention these two works of editorship; both deserve extensive reviews—though, meanwhile, both should have appreciative, even humble and grateful, readers.

PUBLISHER. No good book is ever really neglected.

EDITOR. No real reader is ever neglected. Thank the publishers for that. *I* thank them for *Trial of Dr. Adams* (Simon & Schuster) by Sybille Bedford; for *Borstal Boy* (Knopf) by Brendan Behan; for *Room in Moscow* (Reynal) by Sally Belfrage. Three so different, three so—simply readable.

—NOLAN MILLER

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